TBB. The Business Booster by InnoEnergy

#TBB2016

Creating the future of sustainable energy today

23-24 November, 2016 Barcelona

Over 150 sustainable energy innovations under one roof

Event programme and exhibitors catalogue

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GSGF Global Smart Grid Federation

Belgium

TWEED

Belgium

Capenergies

France

i-CLEANTECH VLAANDEREN enabling the future

Belgium

APPA Asociación de Empresas de Energías Renovables

Spain

ACCIÓ Generalitat de Catalunya

Spain

Contents

Foreword

Welcome to the fourth edition of The Business Booster, where we connect industry with innovation to ensure that commercially attractive products and services are brought to market.

At InnoEnergy, we believe that Europe has the people and the ideas, the resources and the skills to create a fully sustainable energy industry. Our role is to bring them together and encourage new ways of working.

By connecting ideas, innovators, entrepreneurs, industry and investors we are able to produce a broad array of new technologies, products and solutions that can be sold to global customers. With 160 start-ups and 78 innovative products and services supported, we are in a position to showcase the best and most advanced of these sustainable energy technologies to you at The Business Booster.

Where else in Europe would you get the chance to see 160 cutting edge sustainable energy technologies under one roof? By providing industry with the unique experience to meet the entrepreneurs and innovators behind these technologies, we hope to facilitate new partnerships and discuss new ways of working. We want to inspire you to stay ahead of the game by giving you the opportunity to introduce innovative products and solutions into your technology roadmaps, whilst supporting you to meet your sustainable energy targets.

So with this in mind, I hope that in its fourth year, The Business Booster proves to be yet again another win for all of us. And, above all, I hope that we will all leave with renewed perspective and motivation to work together to empower a sustainable energy future.

Diego Pavia. *CEO, InnoEnergy*

The Business Booster: a marketplace for sustainable energy innovations

The Business Booster is a forum where industry meets innovative solutions proposed by high growth ventures and SMEs. The innovations you will discover at The Business Booster have the potential to enhance technology roadmaps and provide opportunities to enter new markets.

Where else could you find more than over 150 sustainable energy innovations under one roof?

TBB: the place to be for sustainable energy innovation

- Breakthrough innovations to enhance your portfolio
- Great networking opportunities
- Inspiring speakers
- A trusted innovation ecosystem

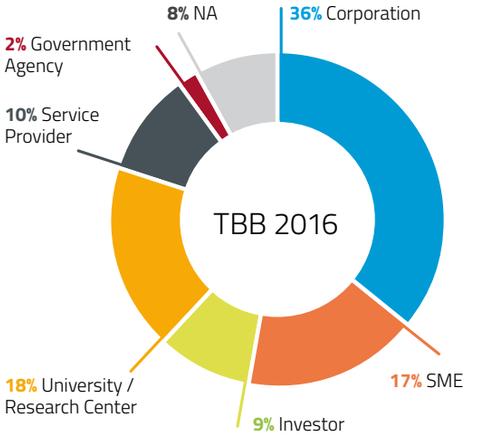
Key figures

600+
Attendants

200+
Unique companies

25+
Countries represented

Who are the attendants of TBB?



Their main expectations...

To **network** with other companies.
To **meet** 150 technology suppliers.
To **learn** about specific energy topics presented at the conference.
To **attend** the pitching sessions.

Business model innovation: the next generation of innovation in the energy industry

The word innovation is generally associated with new technology and patents, while business model innovation is often dismissed as something of lesser importance. Yet in many cases, business model innovation actually has a greater impact than technological innovation.

Indeed, no matter how impressive a technological breakthrough may be, it remains simply "an invention" until it succeeds in reaching the market, only then can it be called an innovation. A new business model is increasingly seen to be the key enabler for the adoption of any new technology by the market.

According to IDC Energy Insight, published in 2015, establishing new business models was the number one priority of European Utilities ahead of all other challenges, even those such as lowering costs or improving operational efficiency.

This may seem surprising, but the reason lies in the new competitive landscape transforming the energy sector. The traditional energy marketplace has been replaced by a contemporary context, facilitated by a number of key disruptive technological innovations, lower costs, mass-scale storage solutions, EV, distributed generation, and so forth.

This new energy marketplace involves more players and a customer that becomes "prosumer". It brings new requirements to the market, such as enhanced integration and increased interconnections.

All these factors combine to shake the ground on which incumbents play on, and it is for this reason that business model innovation is becoming essential: as a means to discover new ways in which revenue can be generated on a rapidly evolving playing field.

As business model innovation amounts to a transformation of the entire system, it cannot be thought of as a quick fix. At InnoEnergy we are aware of the difficulty of predicting which business models will succeed in the future. We therefore present a programme that we have developed in close conjunction with those very companies pioneering in this transition. We hope that it will help guide you through the short-term trends and bring much needed light to the subject.

Our 150 exhibitors will also be a source of inspiration. Indeed, collaboration with start-ups is one of the most effective means in which new business models can prove their worth, bringing new competences into your company that may not be represented in-house.

This is an exciting time for the energy industry, and we are delighted to have you share it with us at this 4th edition of The Business Booster: creating the future of sustainable energy today.

Welcome!

Elena Bou. *Innovation Director, InnoEnergy*

The programme

Key note speech

Peter Carlsson, *angel investor, board member & advisor. Former VP Supply chain* Tesla motors. Peter Carlsson joined Tesla Motors in 2011 as Vice President of supply chain with the mission of building a world class supply chain for electric vehicles. Starting from scratch, he has built up an organisation with complete end-to-end capabilities. The first phase of the assignment was to secure a successful industrialisation and launch of the Model S with Tesla's 300+ suppliers in 18 months. Secondly, the team managed to turn a negative gross margin into a 28% surplus within the first year of production. As the company launched the Model X earlier this year, Peter decided to step out and do some other projects.

Before joining Tesla, Peter worked for NXP (former Philips Semiconductors) and Sony Ericsson. Peter has a Master's degree specialising in production and quality control, which he obtained from Luleå Technical University in Sweden. He is also part of several advisory boards for global supply chain and procurement organisations.

Panel debate

Change of business models in the energy sector

The European energy sector is undergoing a fundamental transformation from a top-down centralised system controlled by a limited number of players to a bottom-up decentralised competitive market with many different players offering new forms of energy and new products and services.

This roundtable debate will try to answer these key questions:

- Which new business models are likely to shake up the energy market?
- How can energy companies already established and new entrants coming from profit from the new opportunities?

This panel is co-organised with

energypost

Speakers

Mohamed Anis, *Associate Vice-President Energy, Utilities, Communications and Services* Infosys. Mohamed Anis has dedicated the last 20 years to bringing tech led innovation to some of the largest organizations across the globe. He has been helping companies "Renew" their world through digitization whilst creating "New" frontiers so they can be the first to disrupt their own industry. An ardent advocate of Machine Learning and A.I, he has been spearheading the development of new platforms in the world of Energy and Services to leverage their data – the new oil of the 21st century with the development of systems that are now crunching offshore oil rig data, foreseeing system failures in real time.

Christian Chudoba, *CEO and co-founder* Lumenaza. Dr. Christian Chudoba is CEO and co-founder of Lumenaza. He graduated in Physics at the Humboldt University in Berlin and did research at the Massachusetts Institute of technology (MIT). Coming back to Germany he worked intensively on highly scalable software for telecommunications and utilities at Siemens. There, he led the solution business for billing and customer care software. To actively promote the energy revolution, he founded the Lumenaza GmbH together with Dr. Bernhard Böhmer in 2013.

Marie Fossum Strannegård, *Head of Consulting at Ericsson Vice President.* Marie Fossum joined Ericsson in November 2014 to head up the Utilities industry practice. Prior to joining Ericsson, Marie served as Vice President Solar Business Unit at one of the Nordics' largest utilities providers, Fortum. With her background in both management/IT consulting and utilities, Marie has extensive experience in business development processes. She is known to be business minded and result oriented. She has an international experience, having served customers in many countries during her carrier. Since the 1st of July 2016 Marie is responsible for Eriksson's consulting unit across all industries.

Laurent Yana, *Strategy director* at Engie. Laurent Yana graduated from Ecole Polytechnique and Ecole Nationale Supérieure des Mines de Paris. He went on to work in the IT Department at EDF-GDF, which was followed by his role of Head Pricing in the Marketing Division of Gaz de France. From 1994-2006 he held various positions in Gaz de France, including Head of Transit and Sales (Gas Purchase Division), Deputy Managing Director (Regional Gas and Power Distribution), Project Director M&A (International Division) and Head of Department (Strategy Division). From 2008, Laurent Yana was Vice President of Strategy at GDF SUEZ. Presently he is the Director and Advisor of Global Bus, Strategy Division at ENGIE.

Moderator

John Raspin, *partner* Frost & Sullivan, *Global head* of Frost & Sullivan's Energy & Environnement. John has been a consultant to the industry for over 20 years and is the global head of Frost & Sullivan's Energy & Environment business. Focused on visionary innovation and market transformation, John is a thought leader in the fields of Power Generation, Renewable Energy, Environment, Smart Grids and Buildings (including energy efficiency, energy management, smart buildings, lighting and facility management). John's personal focus in the energy arena revolves particularly around the role of energy management, new business models, utility transformation and advanced technology in driving sustainability and business productivity.

Showcasing smart energy systems from northeastern Germany

WindNODE stands for the efficient system integration of large renewable generation capacities based on digital networking. Innovative, user-oriented products and services representing *"energy transition made in Germany"* are tested and presented here in a large-scale real laboratory in order to develop mass market solutions.

WindNODE is an initiative of the German capital region and northeastern Germany with a network of more than 50 partners from the energy industry, information and communication technology, industry, trade and science. WindNODE will start at the end of 2016 with a duration of four years. Berlin Partner is a member of the WindNODE-board and will be responsible for the coordination of one work package concerning participation and dissemination.

www.windnode.de

Berlin Partner for Business and Technology

Business and technology support for companies, investors and scientific institutions in Berlin – this is the Berlin Partner für Wirtschaft und Technologie GmbH mission. With customized services and an excellent science and research network, our many experts provide an outstanding range of programs to help companies launch, innovate, expand and secure their economic future in Berlin.
A unique public-private partnership, Berlin Partner for Business and Technology collaborates with the Berlin State Senate and over 200 companies dedicated to promoting their city. Berlin Partner is also responsible for marketing the German capital to the world, for example with the successful "be Berlin" campaign.

www.berlin-partner.de/en/about-us

Open Innovation Village

This year, for the first time, industry players will join us on the exhibition floor. They are part of what we call The Open Innovation Village, a networking spot where industry players pioneering in their collaborations with start-ups take a central role, participating in the B2B meeting directly alongside start-ups and SMEs exhibitors.

Open innovation is all about collaboration. These forward-thinking companies access innovation by acknowledging the benefits of searching for new ideas beyond company boundaries rather than relying on internal development. Open innovation is also related to the theme of this year's edition of the event, encouraging companies to be open to new business models and skills that may not be represented in-house.

Exhibitors

Engie is the world's first independent power producer. The Group develops its businesses (power, natural gas, energy services) around a model based on responsible growth to take on the major challenges of energy's transition to a low-carbon economy: access to sustainable energy, climate-change mitigation and adaptation and the rational use of resources. Engie works closely with entrepreneurs, startups and experts to innovate and build together solutions designing the energy of tomorrow. Since 2014, Engie has launched 45 Calls for projects, receiving close to 1,000 applications on its innovation platform (http://openinnovation-engie.com/en/) from startups and rewarding more than 50 winners.

Principal Power, founded in 2007, is a technology and service provider to the offshore wind industry. Principle Power's innovative and proven technology the WindFloat – a floating wind turbine foundation – provides access to transitional and deep-water offshore wind sites. By simplifying the way offshore wind is deployed, this unique technology assists the on-going development of the offshore wind industry as whole, opens new deep-water markets, and has the potential to substantially decrease the cost and risk profile of offshore wind projects. Principle Power, with offices in the USA, Portugal and France, sells the WindFloat as a technology solution and acts as a service provider to developers, independent power producers and utilities engaged in the rapidly expanding global offshore wind market.

Schneider Electric is the global specialist in energy management and automation. The organisation Open Innovation aims to accelerate the development of innovative offers by turning the company focus outwards. Our goal is to seek a closer relationship between partners, clients, start-ups and universities in the development of products and services. Schneider Electric is very much aware that innovation cannot rely wholly on internal processes alone. As digitisation comes into effect, economic cycles run at faster rates, such as in emerging countries, for example. Schneider Electric cannot afford to waste time or to go all-in on a single technology. We therefore seek to provide the whole corporation with greater agility, most specifically in research and development processes.

Veolia group is the global leader in optimised resource management. With over 179,000 employees* worldwide, the group designs and provides water, waste and energy management solutions that contribute to the sustainable development of communities and industries. Through its three complementary business activities, Veolia helps develop access to resources, preserve available resources, and replenish them. In 2014, the Veolia group supplied 96 million people with drinking water and 60 million people with a wastewater service, produced 52 million megawatt hours of energy and converted 31 million metric tons of waste into new materials and energy. Veolia Environnement (listed on Paris Euronext: VIE) recorded a consolidated revenue of €24.4 billion* in 2014. www.veolia.com (*) 2014 pro-forma figures including Dalkia International (100%) and excluding Dalkia France.

Open Innovation panel debate

Four corporations, EDP, ENGIE Schneider Electric, Veolia and one start-up, Principal Power, will be on stage to share their open innovation strategy as well as real cases of collaboration between start-ups and corporations.

Our Open Innovation Village exhibitors are pioneering the way in open innovation and will illustrate how collaborating with start-ups and SMEs can reduce costs, accelerate the time to market of innovations, increase differentiation and create new revenue streams for the company.

Speakers

Sylvain Paineau, *Open Innovation Europe Director* ,Schneider Electric
Sylvain Paineau has worked with Schneider Electric since 2004, where he is in charge of managing innovation partnership in strategy and technology corporate organisation, (projects portfolio, incubator, start-up relationships and R&D partnerships. He also coordinates strategic cooperation between Schneider Electric and a major European research centre. He has held several innovation management positions in the industry during the last 25 years, and managed several R&D European projects. He was in charge of MEMS lab in Thales (1997-2001) and more recently was marketing and technical director of PHS MEMS (2001-2004), a start-up in the MEMS foundry business. Sylvain Paineau holds a degree in Optronic Engineering from Paris XI University.

Laurence Duyck, *Open innovation program director,* Veolia
Laurence Duyck is currently in charge of Veolia's Open Innovation initiative, focused on start-ups, SMEs and entrepreneurs. She is responsible for sourcing, evaluating and managing the integration of external innovative solutions in close conjunction with strategy, marketing, business development, and business unit teams. Veolia is a leading company in delivering water, waste and energy services. Before joining the field of innovation, Laurence spent 20 years in environmental management, holding diverse positions in the industrial field, (risk studies and management, due diligences, remediation).

Guillaume Ardoise, *Business development manager Europe,* Principle Power
Guillaume holds a Masters in Naval Architecture and Offshore Engineering from the University of California, Berkeley. He worked for over 10 years in the offshore oil and gas industry and held several positions as engineer, project manager and eventually business developer before creating his own consulting company, specialised in marine renewables. During his career he has been involved in multiple floating wind technologies, ocean thermal energy conversion as well as wave energy converter development projects. He joined Principle Power in 2015, supporting business development efforts in Europe.

Ivana Wunderova, *Project Manager,* Innovation and New Business Department, ENGIE
Ivana is working on open innovation initiatives and launching calls for projects internationally for ENGIE, in cooperation with external innovation ecosystem (incubators, innovation centers, universities, etc.), in order to respond to needs of ENGIE operational units. She participated in the launch of the open innovation platform OpenInnov by ENGIE. She additionally worked on partnerships to help innovative SME expand their activities abroad through ENGIE's international presence. Previously, Ivana elaborated European Union financed international projects for SMEs, universities and municipalities. She studied international business and economic diplomacy.

Luis Manuel, *Executive Director and Board Member of EDP Inovação,* in charge of the Venture Capital Fund of the EDP Group (EDP Ventures).
Luis Manuel has held this position since January 2008 with responsibilities that include company management and defining EDP group innovation strategy.
He is a board member of EDP Ventures (since 2008), CEO (since 2009), Windplus (since 2009), Arquiled (since 2010), all in the scope of his job assignment with EDP Inovação SA. He worked for 2 years at Explorer Investments, the largest private equity firm in Portugal and for 6 years in the strategy and business portfolio department of the holding of the Galp Energia group (the largest Portuguese oil and gas group). Prior to that, he worked at Espírito Santo Investment, in the project finance advisory department in Lisbon, and in the corporate finance department in Portugal and Brazil. As member of the Ministry of Economy during the XVI Portuguese Constitutional Government, he assisted the Undersecretary for Economic Development with oversight responsibility over several privatisation processes in the energy sector, as well as in the process of defining the three major laws regulating the Portuguese energy sector ("Leis de Base" of the oil, natural gas and electricity sectors). He holds a degree in Economics from the "Faculdade de Economia da Universidade Nova de Lisboa".

Moderator

Prof. Dr. Alfons Sauquet, *Global Dean* of ESADE Business
Chaired Professor at ESADE, University Ramon Llull, Barcelona.
Completed his doctorate at Columbia University, Masters in Organisational Psychology at Columbia University, MBA at ESADE, plus degrees in Philosophy and Psychology at the University of Barcelona. He has served as the global dean of ESADE (business an law schools) 2014-2016, as dean of ESADE Business School from 2007 to 2014 and previously served as vice-dean of research and director of university programmes. Acting president of the Academy for Business in Society (ABIS) and associate director of quality services in the European Foundation for Management Development (EFMD). He has served and chaired the board of directors of the Global Management Admission Council (GMAC) and served as elected member of the board of governors of the European Institute of Innovation and Technology (EiT). He was invited keynote speaker at the annual meetings of the EFMD, the American Association of Collegiate Schools of Business (AACSB), the Latin American Assembly (CLADEA) and the Aspen Institute, among others. Served on the editorial boards of Human Resources International and the European Business Forum. His latest publication is: "Business Schools and their Contribution to Society", Sage 2012. Furthermore, by invitation of the European Commission, he has participated on different policy roundtables (European/Australian (Melbourne) Sino/European (Shanghai).

Agenda

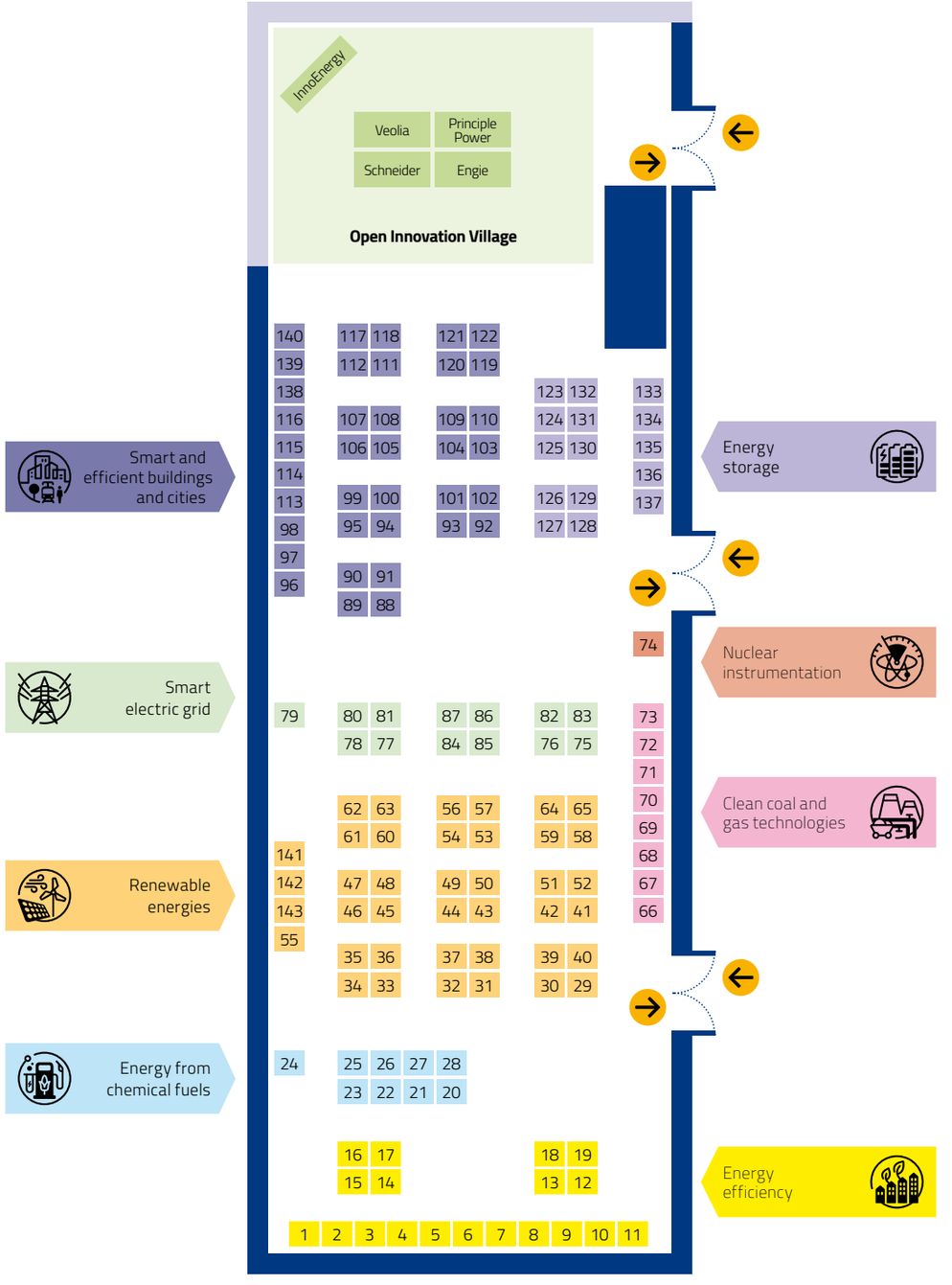
23 November

08.00 - 09.00	**Registration** *Showroom Area*
09.00 - 09.30	**Welcome to TBB.2016.** *Auditorium* **Diego Pavía,** *CEO of InnoEnergy* **Elena Bou,** *InnoEnergy Innovation Director* Welcome message from Maroš Šefčovič, VP European Commission for the Energy Union
09.30 - 10.30	**Opening Conference. Keynote Speech.** *Auditorium* **Peter Carlsson,** *angel investor, board member & advisor. Former VP Supply chain Tesla motors*
10.30 - 11.00	**Networking & Coffee break.** *Showroom Area*
11.00 - 13.00	**Pitching Sessions.** *Room H3 and Room J – Level -1* Parallel Sessions
13.30 - 15.00	**Networking & Lunch.** *Showroom Area*
15.00 - 16.00	**Change of business models in the energy sector.** *Auditorium* Moderator **John Raspin,** *partner Frost & Sullivan* Speakers **Marie Fossum Strannegård,** *VP, Head of Energy and Utilities at Ericsson* **Laurent Yana,** *strategy director at Engie* **Christian Chudoba,** *CEO and co-founder Lumenaza* **Mohamed Anis,** *Associate Vice-President Energy, Utilities, Communications and Services Infosys Ltd*
16.00 - 16.30	**Networking.** *Showroom Area*
16.30 - 18.00	**Pitching Sessions.** *Room H3 and Room J – Level -1* Parallel Sessions
18.00	**End of the day**
20.30 - 01.00	**Welcome cocktail & Social dinner.** *Showroom Area* Social dinner will be hosted at the congress venue

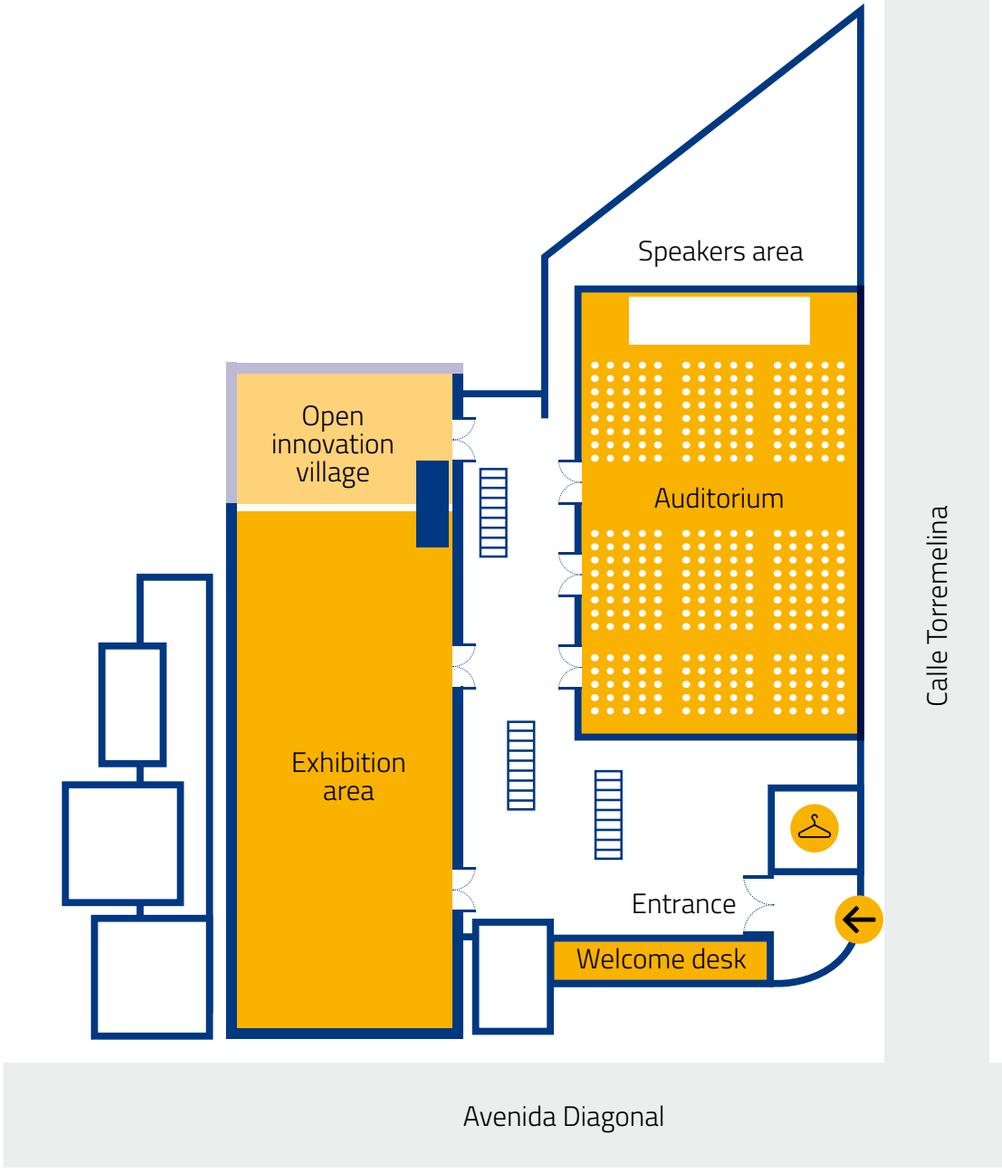
24 November

09.00 - 09.30	**Networking** *Showroom Area*
09.30 - 11.45	**Pitching Sessions.** *Room H3 and Room J – Level -1* Paralell Sessions
11.45 - 12.30	**Networking & Coffee Break.** *Showroom Area*
12.30 - 13.30	**Open innovation roundtable.** *Auditorium* Moderator **Prof. Dr. Alfons Sauquet,** *Global Dean of ESADE Business* Speakers **Sylvain Paineau,** *Open Innovation Europe Director Schneider Electric* **Laurence Duyck,** *Open innovation program director, Veolia* **Guillaume Ardoise,** *Business development manager Europe, Principle Power* **Ivana Wunderova,** *Project Manager, Innovation and New Business Department, ENGIE* **Luis Manuel,** *Executive Board Member at EDP Innovation*
13.30 - 15.00	**Networking & Lunch.** *Showroom Area*
15.00 - 15.30	**Pitching finals.** *Auditorium* The audience will choose five finalists among the start-ups from the previous pitching sessions. Those start-ups will pitch again in front of the jury composed of experts from the industry and the venture capital firms. The jury will choose the winner and two finalists.
16.00 - 17.00	**Pitching awards & Closing speech.** *Auditorium* **Gonzalo de Mendoza Asensi,** *Member of Cabinet of Commissioner Miguel Arias Cañete in charge of Climate Action and Energy*

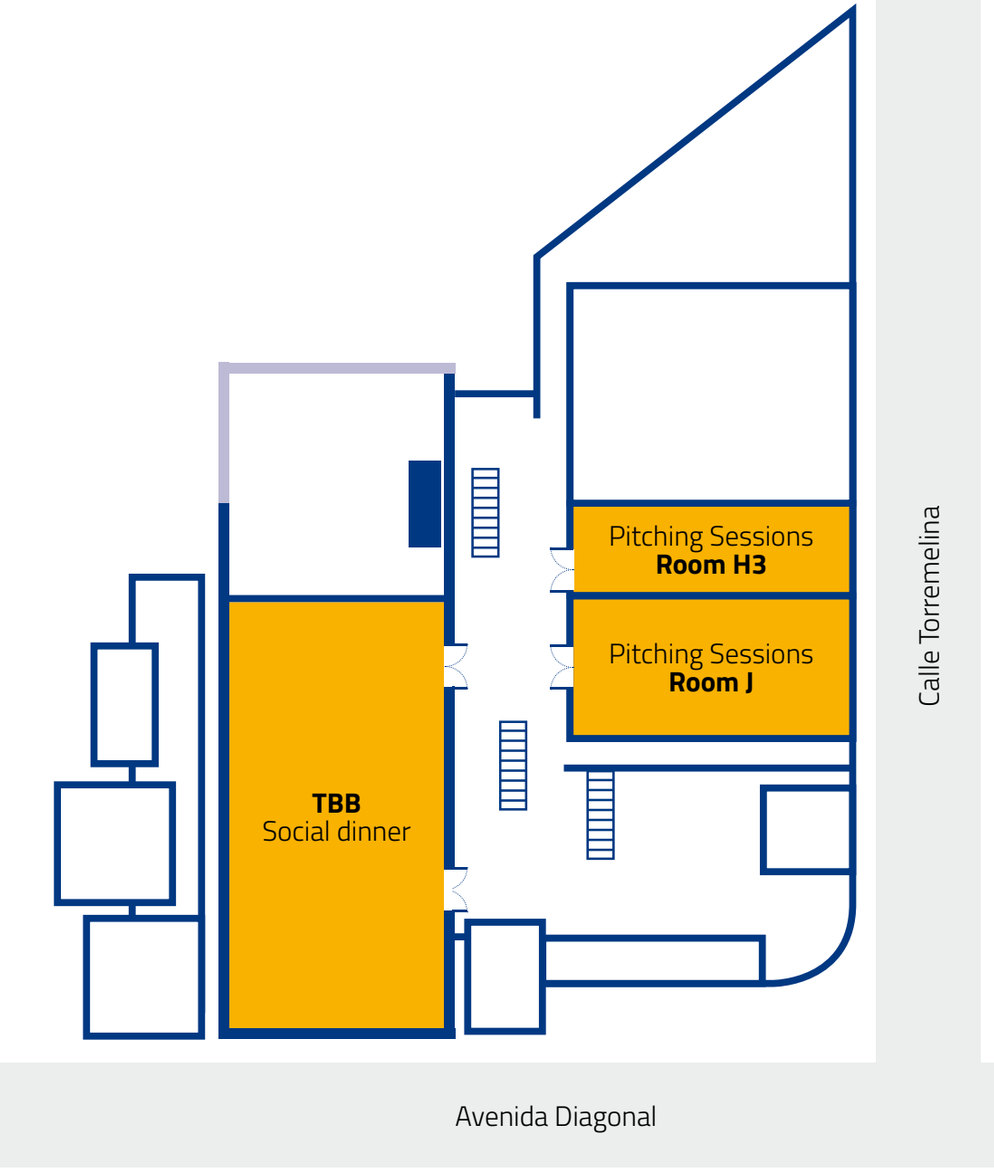
Exhibition area



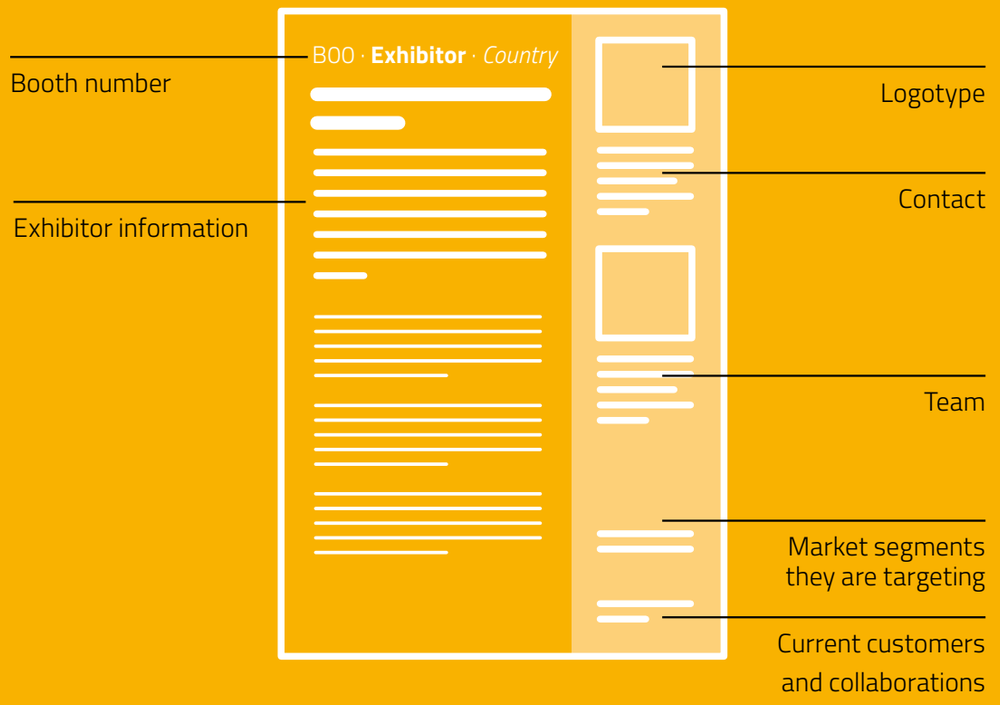
Exhibition area
Level 0



Exhibition area
Level -1



How to read the exhibitors page



Exhibitors are classified by thematic field with regards to their technology.
If you wish to gain more detailed knowledge about which exhibitors are of most interest to you, take a look at the classification of the market segment they target. This can be found at the end of the catalogue, on page 196. Consult the list of exhibitors in the market segment that your company belongs to. In doing so you can discover those products that are of most relevance to your company.

Exhibitors

Energy efficiency

B01 · **Cascade Drives** · *Sweden*

High performance linear drives

Cascade Drives has developed electromechanical linear drives that use a compact and efficient cascade gearbox to provide high performance linear motion. Linear motion is a fundamental function in many different machines and has a large impact on process cycles, efficiency and operation costs. The company aim is to substitute inefficient hydraulic systems in various applications and facilitate the transition to all-electric machines and achieve energy savings by a minimum of 20% and also provide productivity and lower life cycle costs.

THE NEED.

Today there is an evident trend for transition to all-electric solutions for different industry equipment where the desire is to have complete electromechanical systems in order to reduce energy consumption and emissions. This transition is particularly difficult in heavier equipment because there are no electromechanical solutions within linear motion that can offer heavy-duty performance.

THE SOLUTION.

Cascade Drives electromechanical linear drive utilises a unique gearbox technology which enables high performance capabilities of high load and high speed capacity as well as high energy efficiency. The high performance attributes achieved by Cascade Drives technology make it suitable for heavy-duty operations.

VALUE PROPOSITION.

Cascade Drives' linear drive offers a unique performance capacity unmatched by competing solutions. The cascade gear technology allows for compact linear drive systems with capabilities of combining high load and high-speed capacity, and with high efficiency. A linear drive is a critical component in all kinds of machines and the Cascade Drives solution results in operations with reduced cycle times, energy consumption, down-time and lower total cost of ownership for end users.

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THE TEAM

Linn Sevefjord
Business Development Manager

Master of science degree in product innovation management, Linn Sevefjord has developed her professional career working with Cascade Drives from the start.

MARKET SEGMENTS

- Industry

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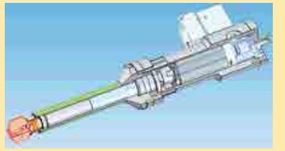

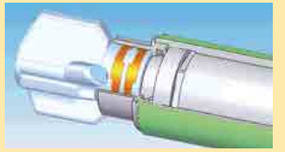

THE TEAM

Cereus Technology's team consists of three experienced professionals with complementary knowledge and skills related to entrepreneurship, combustion engine technology, intellectual property, management and finance.

B02 · **Cereus Technology** · *Netherlands*

Novel Fuel Injection Technology for Internal Combustion Engines

Cereus Technology provides fuel injection technology, referred to as HICI, that improves the combustion process inside the combustion chambers of engines, thereby reducing the fuel consumption and eliminating the formation of particulate matter (PM) and NOx. HICI fuel injectors can be (retro-) fitted in any existing internal combustion engine.

THE NEED.

There is global consensus regarding the need to reduce the consumption of fossil fuels and to reduce the emissions of CO_2, PM and NOx.

THE SOLUTION.

The HICI solution comprises rotating fuel injectors which ensure complete combustion by creating a homogeneous fuel-air mixture in the combustion chamber of engines.

VALUE PROPOSITION.

- At least 25% reduction in fuel consumption and hence in CO_2.
- Prevention of PM formation and PM emission. PM/soot filters no longer required.
- Prevention of NOx formation and emission.

B03 · **Composite Dynamics** · *Germany*

The “Sea Carver” is an innovative motorboat equipped with an active hydrofoil system to reduce power consumption and improve driving dynamics

Composite Dynamics develops, produces and sells sports and business boats with an integrated active hydrodynamic foil system. This is designed as a combination of an electronic controlled retraction mechanism and an adaptive composite wing technology. The purpose is to lift the vessel out of the water and to adjust to various cruising situations automatically. The result is highly maneuverable vessel that can enable e-mobility on water because it can extend the operation time up to 300%.

THE NEED. As on other forms of transport, customers aim for clean concepts (less noise and pollution) and lower consumption (fuel costs) on vessels. The ‘clean’ image has intruded into almost every niche. There is a strong demand to reduce power consumption by keeping or even rising overall performance of a craft.

THE SOLUTION. Hydrofoils are a very efficient solution to reduce power consumption of vessels. With the special help of our self-developed electronic controlled hydrodynamic foil system, a reduction in power consumption by 70 % can be realised without any restrictions in the usage of the boat.

VALUE PROPOSITION. This hydrodynamic foil system is electronically controlled and has adaptive composite foils to achieve agile and dynamic driving characteristics in any situation. Additionally, highly efficient combustion or electric outboard engines are used to reduce emissions. It is designed to register as a standard boat. The patent (pending) can be licensed to other manufacturers and the adaptive composite technology can be transferred to other markets (aerospace, automotive).

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THE TEAM

Peter Schnauffer
Founder and CEO

Oliver Schweizer
Head of Styling/Design

Michael Thanner
Electronics Development

Marcus Schwab
Technology Development and Production

Markus Strube
Business Development

MARKET SEGMENTS

- Smart energy efficient mobility

B04 · **Dexter Energy** · *Netherlands*

Smart energy efficiency for medium-sized industrial companies

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pieter@sensorfact.nl
www.sensorfact.nl

THE TEAM

Pieter Broekema
Co-Founder

Degree in Physics, Masters in Energy & Environmental Sciences. Work experience in strategy consultancy, plus entrepreneurial experience of 2.5 years. Annual growth: 300% (two years in a row).

MARKET SEGMENTS

- Industry

Sensorfact is an innovative start-up that has developed an intelligent software tool for medium-sized industrial companies. This tool helps such companies increase their process and machine efficiency. Moreover, Sensorfact offers and implements process optimisations on a ‘no cure, no pay’ basis. Sensorfact is a joint venture between the start-up Dexter Energy and ENGIE.

THE NEED.

Sensorfact enables medium-sized industrial companies, many of which lack the knowledge and investment capability to make best use of new technologies, to leverage the advancement of the ‘internet of things’ (IoT), and in doing so minimise their operating costs.

THE SOLUTION.

Sensorfact offers a product and a service:

- The product is a software tool, which helps the manager of a plant increase its efficiency by providing data-driven feedback.
- Data-driven process optimisations are offered as a ‘no cure, no pay’ service.

VALUE PROPOSITION.

Sensorfact is unique through:

- Market specific algorithms.
- The combination of a product and a service.
- No cure, no pay.
- The cooperation between a start-up and a large corporation.
- A complete service.

B05 · **DoM'Innov** · *France*

A modular structural wall system offering high energy performance

DoM'Innov develops and manufactures an innovative modular wall system offering exceptional structural and thermal performance. The goal is to help construction-industry professionals build single-family homes better and faster while ensuring the best possible energy performance for tomorrow's buildings.

THE NEED.
The Blokiwood® modular wall system is designed specifically for the needs of single-family-home builders, offering the ease of use and energy performance only prefabricated building envelope materials can provide.

THE SOLUTION.
Blokiwood® features 21 standard modules, lightweight enough to be hand-carried, and connector units. Custom modules and engineering and consulting services are also available. The solution can enhance the energy efficiency of virtually any type of architecture while speeding construction.

VALUE PROPOSITION.
Blokiwood® breaks down load-bearing walls into 60-cm modules while virtually eliminating thermal bridges and air leaks. This standard product builds insulation and airtightness right into a building's load-bearing walls. It meets construction-industry professionals' need for a high-performance, easy-to-use, lightweight solution.

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www.blokiwood.fr

THE TEAM

Joël Menard
CEO

Design engineer with 15 years of experience in wood-based construction, design, and construction project management.

MARKET SEGMENTS

- Residential building

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THE TEAM

Arnaud Legrand
CEO

Food Engineer and Environmental Engineer (AgroParisTech Engref). MBA (Paris Collège des Ingénieurs). 10 years of experience as an energy performance consultant at EY for manufacturing companies.

MARKET SEGMENTS

- Industry

B06 · **Energiency** · *France*

Data driven artificial intelligence for smart energy in industry

Energiency is a French cloud software start-up that develops disruptive energy big data analytics solutions for industry. The idea behind Energiency is to provide industrial manufacturers with real-time and powerful web analytics tools. Energiency algorithms allow manufacturers to drive and extend their own energy management system. This enables them to achieve, maintain and accelerate up to 20% energy savings without additional investments and more competitively.

THE NEED. Industrial manufacturers lack energy competitiveness: their energy bill inevitably increases, and operational teams cannot easily manage this problem as they lack relevant KPI analytical means. However, data is all around them! It simply needs to be made accessible so they can make better decisions.

THE SOLUTION. Energiency operates big data algorithms, machine learning and predictive analytics that continuously scan all the information systems in factories (production, maintenance, energy, etc.) and provide real time energy monitoring, assessment and action plans on web and mobile devices.

VALUE PROPOSITION. Energiency offers an innovative business model and differs from competitors in the following features:

- Integration of downstream value chain (audit, action plan) in a disruptive web software based on data-driven machine learning.
- Strict focus on industrial process optimisation with high barriers to entry.
- Software functions aligned with ISO 50001 certification requirements.
- Interoperability and big data cross-analysis of energy, production and maintenance information systems.
- Financial independence from historic market players.
- Disruptive business model based on SaaS recurrent fees.

B07 · **Flue Gas Recovery Sweden**

Makes your heating even more efficient

The Energy Turbo FGR® makes a heating system even more efficient by recovering the flue gas heat and utilising the higher heating value of the fuel. State of the art technology is used to create a cost efficient system, applicable for heating plants sized 100-1000kW. It can be used on any heating system regardless of fuel, as long as hot humid smoke (flue gas) is generated. Currently, Flue Gas Recovery Sweden is focusing on wood pellet and natural gas/biogas fuels. The Energy Turbo FGR® is offered either as an integrated component of a heating system or stand-alone, mounted on the system's exhaust pipe. One of its great advantages is that it can easily be used for retrofitting existing systems.

THE NEED. The demand for heating solutions that meet new environmental requirements and legislation is constantly increasing. This need applies to all kinds of heating systems. In addition, the significant amount of unused energy that is currently lost through the exhaust pipes of today's heating systems needs to be utilised more effectively. Finally, the demand for reducing the costs of heat production is ever present.

THE SOLUTION. By recovering waste energy, Energy Turbo FGR® enables heat producers to achieve higher utilisation of their investment, reduce cost of fuel and mitigate the tougher requirements following the Paris climate conference agreements.

VALUE PROPOSITION.

- Reduces cost of fuel.
- Gives quick payback on investment.
- Meets environmental requirements.
- Makes a combined heat and power unit (CHP) even more efficient.

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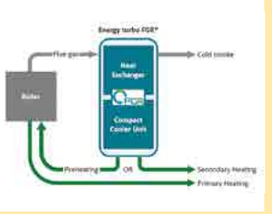

THE TEAM

Thomas Gustafsson
CTO and Founder

Mechanical Engineer and serial entrepreneur with 20 years experience and expertise in the heating business. Dedicated to finding the best solution to meet the customer's needs.

Pernilla Knutas Lundblad
Project Manager and Sales

MSc in Mechanical Engineering with 20 years experience in management and project management positions in product development at large Swedish companies.

MARKET SEGMENTS

- Heating & Cooling
- Industry
- Tertiary (non-residential) building
- Residential building

B08 · **FuGen Tech** · *Belgium*

Creating racing experiences for future generations

FuGen Tech provides technical solutions to give the currently polluting racing industry a clean makeover, applying the latest energy and propulsion technologies available.
In providing drivers with new technologies to improve performances, the racing world and the gaming community become connected.

THE NEED.
Environmental norms are becoming increasingly strict. The very future of the current racing industry is at threat unless technology advances at such a pace as to offer solutions to save it. Additionally, there is a need to branch out beyond the confines of the pure racing world and deliver additional experiences to racing drivers, linking the real racing environment to that of the virtual.

THE SOLUTION.
Innovative smart helmets add additional experiences that enhance drivers' training while also offering gaming potential. These helmets are linked directly to the vehicle's electric drivetrain, using the latest technologies in the field.

VALUE PROPOSITION.
A more efficient use of vehicles and/or karts through dynamic charging amounts to higher occupation ratio and lower energy consumption per kart. By linking the system to smart helmet technologies, drivers can receive direct feedback on their performance and racing statistics. Additionally, the helmet directly links the virtual community to the real racing world, a fun and innovative concept that may potentially attract a whole new market of thrill-seeking customers.

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THE TEAM

Thomas Cuypers
CEO

Degree in MSc Mechanical Engineering plus an MBA. Developed his professional career in the automotive sector for 8 years in different positions in engineering, sales, supply chain and operations departments.

MARKET SEGMENTS

- Smart energy efficient mobility
- Industry

B09 · **GulPlug** · *France*

Magnetical electrical outlet and sensor: a new way to connect, easier, faster and safer

Gulplug has two offers: rethink the connection of your machines to electrical power thanks to a magnetic plug and enable the Internet connection with an energy sensor. Both products open the way to new connected services: energy monitoring, energy saving, process optimization, predictive maintenance.

THE NEED.

How to connect and measure high power in painful conditions? Insulated, sealed and buried conditions? Aerial, submersible and explosive environment? Painful use for disabled people, seniors, children and professionals?

THE SOLUTION.

Gulplug provides a disruptive technology based on magnetic electrical connection with a smart energy sensor in order to plug and measure easier, faster and safer! The magnetic electrical connection is a new shape of flat and twistable plug. The energy sensor is a ready to clamp wireless and self-powered electrical energy estimator. Not intrusive, the sensor reports by radio energy data without any loss.

VALUE PROPOSITION.

Easier, faster and safer connection and measurement to turn any electrical device into an energy efficient connected objects.

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contact@gulplug.com

THE TEAM

Xavier PAIN
Co-founder and CEO

20 years of experience in business development of innovations.

Eric Marsan
Co-founder and COO

Marketing and customer survey expert

MARKET SEGMENTS

- Industry

B10 · **Heat Power** · *Netherlands*

Supercharged steam turbine system for industrial heat and power

Heat Power has developed the Rankine Compression Gas turbine (RCG), which is capable of providing heat and power for industrial processes at highly reduced fuel cost and CO_2 emissions. The RCG system is truly unique, as it is capable of providing both steam and power at fast response times. Its multi-fuel capability allows for application in waste streams, enabling manufacturers to achieve higher resource utilisation, reduced cost of energy and green manufacturing.

THE NEED.

The competitiveness and environmental impact of heat intensive industrial processes can be much improved by reducing the use of energy. However, efficient and fast responsive co-generation systems are not yet available for small-scale industries. Heat Power satisfies that need.

THE SOLUTION.

The novelty of the Rankine Compression Gas turbine (RCG) is, when compared to existing steam cycles, that the steam turbine drives the compressor of the gas turbine cycle. The RCG offers a highly responsive and efficient power and steam production in the range of 1-10MW electric and 3-30MW thermal power.

VALUE PROPOSITION.

- Combined steam and electrical power production.
- Flexible decentralised energy supply.
- Multi fuel, crude biomass and waste stream compatibility.
- Black start capability.
- Fuel consumption reduction ranging from 10% to 30%.

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THE TEAM

Henk Ouwerkerk
Founder

PhD in Mechanical Engineering, specialised in Energy Technology. Over 10 years of experience in consultancy and prototyping for industrial energy systems.

Tom Huizer
Business development

MSc. in sustainable energy technology and InnoEnergy Master school graduate. Has received entrepreneurship and business management training at ESADE business school.

MARKET SEGMENTS

- Gas & Steam Turbines
- Industry
- Off grid

B11 · **MAQ AB** · *Sweden*

StableTools that avoids the cumbersome adjustment previously required before starting the metal cutting process

StableTools is a machine tool constructure in which a mass element is displaced inside the cavity of a cutting tool holder supported by viscoelastic materials with frequency-dependent stiffness. The viscoelastic materials transmit the vibration energy towards the mass elements and stabilise the tool holder during metal cutting.

THE NEED. Manufacturing industries need to increase the degree of automation in metal cutting processes to compete on the market. However, metal cutting automation is limited by the problem of vibration, which causes accelerated tool wear, tool breakage and damaged parts. The adverse impact of vibration increases production costs substantially due to the need for emergency stops that interrupt the production line.

THE SOLUTION. MAQ AB has created StableTools, a vibration-free metal cutting solution built for manufacturing companies whose production capabilities is limited by problems caused by vibration. These customers need a reliable solution which does not require specialist knowledge or training prior to its usage.

VALUE PROPOSITION. Affordability, the same solution costs much less than other competitors' products.

- Higher safety of machining processes, the product automatically adjusts itself when conditions are changed.
- Lower production costs, the cutting insert's tool life is substantially longer than that of standard products.
- Better surface quality, the surface finish of the machine parts are better, which eliminates the need for post processing.
- Easy to apply, operators do not need any specialist knowledge to use these products.

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THE TEAM

Qilin Fu
CEO and CTO
PhD in vibration suppressing techniques on cutting tools, plus 6 years of experience in the field.

Mihai Nicolescu
Active Advisor
40 years R&D experience in metal cutting processes, success in commercialising similar products.

Amir Rashid
Research Advisor
25 years R&D experience in vibration damping solutions, success in commercialising similar products.

MARKET SEGMENTS

- Industry

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THE TEAM

Prof. Vogel, Matthias
Highly experienced with diamond-wire saws since 1980s. Among other achievements, he previously developed the first saw with endless wire and wire connection, which at that time was the first saw to combine such features.

MARKET SEGMENTS

- Industry
- Solar PV

B12 · **MV Diamond** · *Germany*

Semi-automated welding machine to reconnect diamond wires predominantly used in wafer production

MV Diamonds has developed an easy-to-use semi-automated welding system, which can effortlessly be integrated into the existing wafer production process. Due to the durability of the welding point, costly diamond wires can be recombined after a breakage. Significantly, it is also possible to weld a new wire at the end of the sawing process, and thus continue to saw. Up until now, wafer producers have discarded the remaining wire as it lacked the necessary strength.

THE NEED. The breakage of expensive diamond-wire during production is very common, interrupting production and causing significant amounts of wasted wire. Usually, the remaining wire frame of a production saw has about 7 Km of wire and costs from € 300 – 500. To date, this wire field is destroyed every two days.

THE SOLUTION. One MV Diamond welding machine has the capacity to secure wafer production of 10 – 15 saws. Thus, this machine can amount to €3.000 – 5.000 in savings every two days, that means annual savings of €396.000 – 660.000 for every machine used. MV Diamond semi-automated welding machine can be easily integrated into existing wafer production lines with minimal training. A network interface allows for remote customer support and therefore ensures a high capacity utilisation of the production line. MV Diamonds has applied for one patent and combines 7 years of professional experience.

VALUE PROPOSITION. MV Diamond is the only producer of a semi-automated welding machine, which can ensure up to 3.000 N/mm² strength at the welding point (90% of the core wire strength). Currently, no other producer comes even close to such capacity, which is required to use a welded diamond-wire in the sawing process.

B13 · **Pamyra** · *Germany*

Carpooling for transport contracts

The company's business idea is to exchange freight carriage and cargo space online, making a contract of carriage between dealers, private customers and carriers possible. Our platform Pamyra arranges suitable tours according to size and quantity of freight, location of the sender and the destination. Customers advertise their consignment and receive offers from carriers.

THE NEED.
Every year some 2.9 billion tonnes of cargo are transported around Germany. Approximately 40,000 lorries travel through Germany every day and only half of them are fully loaded.That has a negative effect on traffic density, the environment and the margin of haulage companies.

THE SOLUTION.
Haulage companies advertise their deadweight capacity on routes and state the length of detours they are willing to accept. After a search request the platform calculates the lorries (trucks) with the shortest detour and displays it to the customer.

VALUE PROPOSITION.
Haulage companies can fill their vehicles to capacity. Customers may find suitable transportation for their cargo within minutes, and without the need to register. Our standardised prices prevent predatory 'price dumping' and spare customers comparative offers. Journeys with the least detours are those offered as most advantageous to the customer.

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THE TEAM

Christine Köhler
CFO, Sales, Service
Educated Shipping clerk

Felix Wiegand
CEO, Project management, Development
Software development and Project management in eCommerce

Steven Qual
Webdesign, Frontend development, SEO, Head of Marketing
Many years of experience in eCommerce

MARKET SEGMENTS

- Smart energy efficient mobility

B14 · **Simplex Motion** · *Sweden*

Smart servomotor with very powerful motion control yet weighing only half that of other integrated motors on the market

By utilizing patented sensor system technology, Simplex Motion has created a compact, high-performance and completely integrated servomotor system. This smart motor is quick to install, easy to use and offers powerful motion control capability.

THE NEED. Increasing technological advancement plus global regulations mandating more energy-efficient solutions and lower carbon emissions are driving this market towards a greater use of brushless DC motors. However, their communication requires more electronics and more cables between the motor and its controller. Putting the control electronics and motor into the same housing helps overcome this drawback and integrated motor drive units are increasing in popularity. There is also a growing trend towards decentralized motion control.

THE SOLUTION. Simplex Motion's patented sensor technology and motion control make possible the latest integrated electric servomotors by locating the entire controller in the same housing as the motor – a high-efficiency, low-cost solution. This also allows decentralized motion control, since more control functions and intelligence now sit close to the motor. Engineered for high-torque density, energy efficiency and precise control, the motor's compact design also enables cost optimization and easy configuration.

VALUE PROPOSITION. Compared with other existing integrated servomotors on the market, Simplex Motion's motor excels in output torque and cost efficiency. Its very high torque-per-weight permits small motors very strong for their size. Furthermore, the external encoder used in all other servomotor systems for positioning the motor is eliminated. This is a unique solution.

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THE TEAM

Johan Linder
Founder
Johan is the inventor of the company's technology. Focuses on Product Development and Sales Support.

Mikael Rittander
CEO
Mikael is responsible for commercialisation. Focuses on Sales, Business Development, Financing, IPR strategy and Administration.

MARKET SEGMENTS

- Industry
- Smart energy efficient mobility

CUSTOMER REFERENCES

JBCNC, JMC Industriteknik, OEM Motor and more

B15 · **Sol-Ionics** · *Sweden*

Ionic lubrication technology

Design, synthesis and optimisation of ionic-liquid based lubricants and additives for lubricants for a wide range of applications, such as in energy production, automotive, manufacturing, and aerospace industries.

THE NEED.
The market needs an enabling technology for the energy efficient lubrication of lightweight materials and non-ferrous coatings, and lubricant formulations for increasingly harsh operating conditions, including high vacuum and high temperatures.

THE SOLUTION.
Alpha-ion specifically designs halogen free ionic liquids. Their outstanding properties make them excellent candidates for energy efficient lubrication of ferrous and non-ferrous materials.

VALUE PROPOSITION.
Alpha-ion has developed and patented a new class of ionic liquids that have shown excellent lubrication properties. The new lubricant formulations can be used for energy efficient lubrication of both ferrous and non-ferrous materials. They have also shown excellent thermal stability, hydrophobicity and extremely low vapour pressure.

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THE TEAM

Sergei Glavatskih
Professor of Machine elements
Tribological optimisation of lubricant formulations.

Oleg N. Antzutkin
Professor in Chemistry of Interfaces
Luleå University of Technology.
Design and synthesis of ionic liquids.

Faiz Ullah Shah
PhD in Chemistry of Interfaces
Luleå University of Technology.
Design and synthesis of ionic liquids.

MARKET SEGMENTS
- Industry
- On-shore wind
- Off-shore wind

CUSTOMER REFERENCES
ESA/ESTL

B16 · **Tecnoturbines** · *Spain*

Development and manufacturing of hydraulic microturbines for generating electricity

Tecnoturbines has patented an electronic control system based on regenerative braking technology that recovers energy from the reduction of excess hydraulic pressure. This, along with a hydraulic turbine, is capable of producing electrical power in a controlled manner in different modes, making the process significantly more efficient and providing it with a high capacity to adapt itself to current conditions. This reduces costs and increases efficiency.

THE NEED. Water distribution markets need to reduce the pressure in the water supply in order to prevent breakage and to increase the energy efficiency of the process. They need to reduce the costs of water extraction and distribution due to increasingly high electricity bills. Sites without access to the electric grid need an electric power supply for monitoring and commanding remote stations.

THE SOLUTION. Tecnoturbines offers an electronically-controlled regenerative turbine that is able to adapt its operation to the hydraulic conditions available. This allows the production of electricity from currently unused hydraulic pressure drops at the pressure control valves. This energy can be auto-consumed, or sold to the electricity company to generate income.

VALUE PROPOSITION. The regenerative turbines provided by Tecnoturbines are extremely flexible. They can work in different control modes (maintaining pressure at inlet or outlet, regulating flow, maximising on power generation and on efficiency) so they can be integrated into complex water distribution systems. The system proves a very attractive investment for clients, with a payback of 4 - 5 years (depending on the installed power), clients receive a direct income for the remaining 20 years of product life.

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THE TEAM

Jaime Lledó
Co-Founder and CEO

José Carlos Orts
Co-Founder and R&D Manager

Enrique Ruiz
Co-Founder and CTO

Joaquín Orts
Co-Founder and Production Manager

Jaume Bonet
Partner and Financial Advisor

Maria José Javaloyes López
R&D Engineer

MARKET SEGMENTS
- Hydro

B17 · **Vane Compressors** · *Poland*

A high performance vane compressor based on innovative technology

The Alpha Compressor comprises of a patented vane machine and a unique sliding valve. The vane machine has a cylinder and lateral plates that rotate together with the rotor and the vane. This technology reduces friction and volumetric losses and enables high energy efficiency and a long operational lifespan. The sliding valve permits action upon the air output of the compressor and so additionally improves the efficiency of the compressor.

THE NEED.

The price of a compressor is only 11% of its end cost; energy amounts to more than 70% of a compressor's lifecycle cost. The entire global industry consumes over 764 TWh of electrical energy annually in order to compress air.

THE SOLUTION.

A high performance industrial vane compressor that comprises of a patented vane machine and a unique sliding valve. This technology reduces friction and the volumetric losses of the compressor, making it highly efficient (20% higher) while significantly increasing its lifespan.

VALUE PROPOSITION.

- Superior efficiency than any compressor available today.
- Maintenace cost reduction.
- Consistent working efficiency.

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THE TEAM

Aljoša Bošković
Manager
MSc Electronic Engineer, specialist in sales, business development and management.

Nebojsa Boskovic
Technology Development and Production
MSc Mechanical Engineer, expert in product development, from idea to end product, with wide experience of vane machines and turbine technologie.

MARKET SEGMENTS

- Industry

B18 · **Ve'rtex** · *Sweden*

A new type of railroad switch that uses vertical technology isolated with concrete to save energy

Our company has come up with a new solution for railroad switches. We are now in the process of developing a vertical railroad switch that will remove the problems we have today with snow and ice. Today we need to spend about 60 million kW hours/year to warm up the railroad switches in Sweden. With our solution we have managed to decrease that figure down to 5 million kW hours/year.

THE NEED.

The need is mostly in European countries that have snow and ice based environments.

THE SOLUTION.

It's a vertical switch which is isolated with concrete and therefore saves energy and solves a lot of issues in the railroad switch area.

VALUE PROPOSITION.

Our solution is unique because of its vertical technique and its isolation from ice and snow.

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MARKET SEGMENTS

- Smart energy efficient mobility

B19 · **ZaaK Technologies** · *Germany*

Commercializes a multiple awards winning technology to upcycle fly ash

A waste stream from coal fired power plants into well-defined high quality construction sand material with positive effects in energy efficiency of buildings and smart cities. The technology aims to arrest the depletion of dwindling natural sand, reducing the destruction of ecosystems impacted by sand mining and addresses the socio-environmental problems associated with the disposal of fly ash. The company recently has won Germany-Land of Ideas 2016, Innovationspreis Berlin Brandenburg 2015 and DST-Lockheed India Innovation Growth Programme 2015.

THE NEED. Due to rapid growth in the construction activities causing not only shortages of sand in many parts of the world but also damaging environment. On the other hand, fly ash from hard coal is a low-grade waste by-product with little commercial value and are disposed in hundreds of millions of tonnes annually causing socio-environmental problems.

THE SOLUTION. ZaaK Technologies offers a single-step solution to both sand supply issue as well as fly ash disposal issue by transforming the later one in to value-added lightweight sand called, Smart Sand.

VALUE PROPOSITION. Replacing normal sand with Smart Sand in buildings:

- Improves thermal efficiency by up to 500% resulting in energy cost savings in heating/cooling buildings.
- Reduce the dead-load by up to 12% resulting in savings of energy intensive steel and cement materials and
- Increased life span of buildings by up to 2 times resulting in minimizing consumption of energy intensive cements and steel.

Being ~50% lighter than sand, this results in:

- Savings of fossil fuel from transporting Smart Sand and its derivatives and
- Savings of energy in pumping fresh plaster and concrete.

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THE TEAM

Dr Abbas Khan
Founder & CEO
Product design & development, engineering, and technology commercialization.

Dr Niklaus Grünenfelder
COO
25 years' experience in operation and people management, planning, controlling, budgeting, business and organization development.

Greg Vero
Engineering Director
30 years' experience in design, build and commissioning pilot and industrial plants internationally.

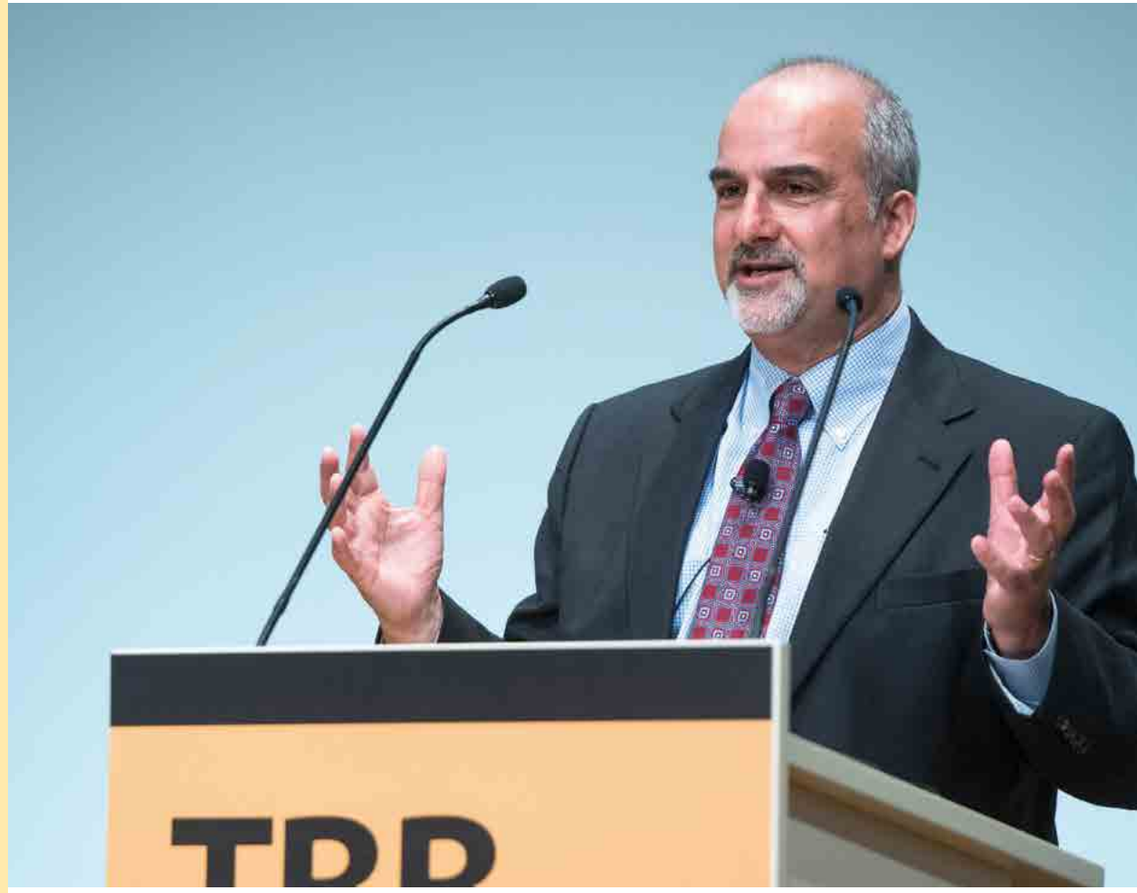
Jagdish Shah
Advisor
Business Development, SH&E, P&L, Sales & Marketing, and Operations internationally.

MARKET SEGMENTS

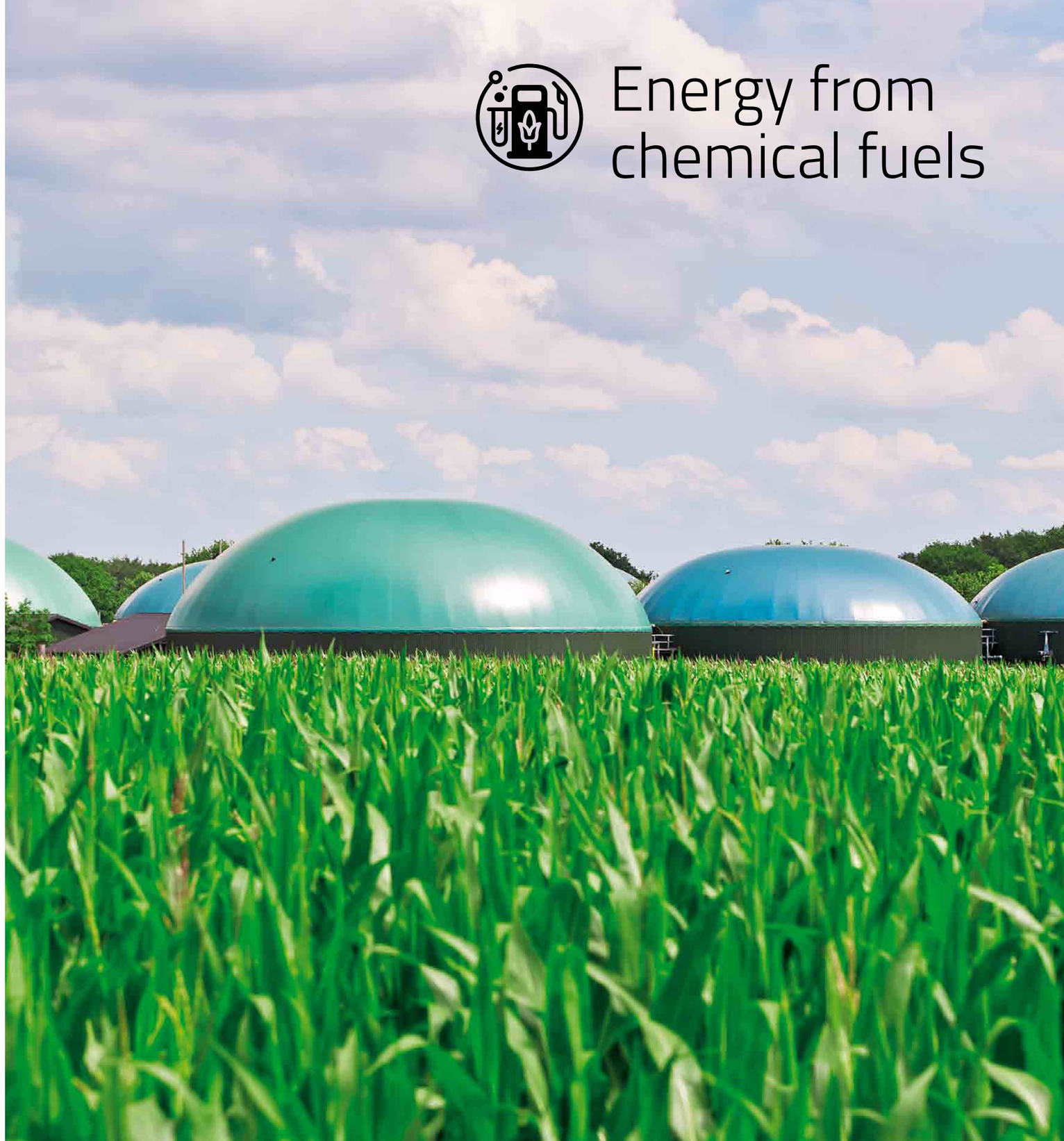
- Building & Construction
- Hydroculture
- Water treatment

"Industry needs to be here: innovation tends not to happen in large companies, the solutions will likely come from individuals outside of the main system and then be brought into it by the industrial players"

David Arfin, *CEO,* First Energy Finance



Energy from chemical fuels



B20 · **AViSpectro** · *Germany*

Enables routine process and quality control by vibrational spectroscopy to industrial customers in energy and pharma applications

AViSpectro wants to be the first choice of connection for customers to instrumentation suppliers in all segments of Analytical Vibrational Spectroscopy, addressing the most relevant challenges in these core industries such as cleantech and economical industry transition in the energy segment, and biotech molecules and regulatory approvals in the pharma segment. In the energy segment, AViSpectro is especially focused on quick determination of coal power plant quality and process parameters as well as characterisation of size-separated coal combustion by-products.

THE NEED. Coal power plant operations need to reduce operational costs and also optimise on by-product sales – both within an environment of increasing regulatory standards. Availability of live stream parameters is crucial for further improvement of coal combustion processes, especially in case of unusual behavior caused by biomass co-combustion. Ash commercialisation is strongly dependent on the exclusion of potential contaminants, such as heavy metal ions.

THE SOLUTION. Customised Raman spectroscopy is used as a non-evasive means of optical detection. Chemo-metric analysis of ash samples, which can be combined and cross-validated with gold standard measurement data, is able to characterise ash fractions according to relevant parameters such as size and heavy metal content.

VALUE PROPOSITION. Continuous determination of harmless and toxic ashes and corresponding ash management is reducing ash disposal cost and leveraging ash sales income of coal power plants e.g. by the absence of heavy-metal ions. In addition, size-separation of coal combustion products further increase the sales potential of higher-value fractions and reduce disposal costs of low-value fractions. AViSpectro products and services are validating sales value of thermal combustion plant by products.

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THE TEAM

Dr. Peter Haug
CEO

PhD in chemistry, business administration, more than 10 years experience in the chemical and pharmaceutical industry and M&A. Founding Angel, setting up technology spin-offs from research organisations.

Richard Knipper
Project Leader Energy

MARKET SEGMENTS

- Fossil solid fuels: Coal

B21 · **C-Green** · *Sweden*

Sludge treatment services for waste treatment plants and bio coal production

C-Green enables wastewater treatment plants to reduce their operating and capital cost, and to meet the environmental target for sludge management. C-Green is also a solid biofuel producer.

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THE TEAM

Erik Odén
CEO and co-founder

+25 years of experience in innovation, market and business development. A serial entrepreneur who has founded more than 5 start-up companies. M.Sc.ME

Fredrik Öhman
Co-founder

+15 years of experience in R&D, process development and implementation in pulp & paper. The inventor of Valmet's Ligno-Boost process. PhD.CE

Fredrik Lundqvist
Co-founder

+15 years of experience in R&D, process development and implementation in pulp & paper. M.Sc.CE

MARKET SEGMENTS

- Biogenic & Synthetic solid and gaseous fuels

CUSTOMER REFERENCES

StoraEnso, OSTP, Tekniska Verken, MIVA

THE NEED.

The sewage waste produced in the wastewater plants in cities all over the world leaves residue sludge that is difficult to dewater, contains bacteria, pharmaceuticals, phosphorous, toxins and heavy metals. Today, wastewater plants fail to reach environmental targets and they carry significant costs for disposing of sludge.

THE SOLUTION.

C-green has a compact, robust and efficient process solution based on hydrothermal carbonisation that separates phosphorous and heavy metals from sludge, degenerates toxins, deactivates pharmaceuticals and transforms the remaining sludge into bio coal.

VALUE PROPOSITION.

- A cost-effective sludge management service that enables the fulfilment of environmental targets, has high uptime and reliability, and eliminates the need for the investment that would be required with today's available technology.
- A homogenous biofuel with a high energy density for power production at CHP plants.
- A potent fertiliser with a high phosphorus content.

B22 · **Comfeb** · *Germany*

Commercialised by ci-tec

Acquires and analyses image data obtained from high performance infrared cameras in cement rotary-kiln systems.

With the help of inspect pro control C, the combustion behaviour of different fuel fractions that are subject to selective fluctuations, such as calorific value, ignition behavior and varying fragment sizes, can be observed online by tracking specific variables. Certain parameters are then derived from this data and incorporated into combustion control to optimise operations.

THE NEED.

As fossil fuels become increasingly scarce and energy costs continue to rise, alternative fuels, such as heavy oil, solvents, solid recovered fuels, and meat and bone meal, are becoming more and more common as a substitute for oil and coal dust. This applies in particular to cement production as its energy consumption is high.

THE SOLUTION.

With the help of inspect pro control C, the combustion behaviour of different fuel fractions that are subject to selective fluctuations, such as calorific value, ignition behavior and varying fragment sizes, can be observed online by tracking specific variables. Certain parameters are then derived from this data and incorporated in combustion control to optimise operations.

VALUE PROPOSITION.

- Lower energy costs.
- Better product quality.
- Longer service life.
- Lower emissions.

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THE TEAM

Holger Schönecker
CEO

Holding a degree in computer science, Holger Schöncker has developed his professional career in the software sector where he has spent more than 20 years as an entrepreneur.

MARKET SEGMENTS

- Biogenic & Synthetic solid fuels
- Heating & Cooling

CUSTOMER REFERENCES

Opterra, Schwenk Zement

B23 · **DeBugger** · *Germany*

Commercialised by Outotec

Demonstration of efficient biomass use for generation of green energy and recovery of nutrients

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MARKET SEGMENTS

- Fossile solid fuels: Coal
- Biogenic & Synthetic liquid fuels
- Biogenic & Synthetic solid and gaseous fuels

THE NEED.

High humidity biomass waste flows - farmyard manure, digestion residues and sewage sludge - are spread as fertilizers on cropland in the vicinity of livestock farms where they are produced. The efficient and safe exploitation of the nutrient and energy value of excrements is mainly hampered by their high moisture content, usually exceeding 90%, and the presence of pathogens and inorganic pollutants. The highly relevant energy and nutrient potential of manure and digestion residues is currently only recovered to a very limited extent because of the technological drawbacks.

THE SOLUTION.

With the technologies delivered by the DeBugger project, most of the before mentioned waste materials could be used for energy generation and phosphate recovery, adding potentially thousands of GWhs of energy from biomass to European grids. In addition, excessive application of organic fertilizers in the vicinity of livestock farms would stop and, as a consequence, eutrophication of inland and coastal waters could be abated. The first innovative product is the closed loop steam dryer for biomass slurries that may alone save up to 75% of the average energy required to evaporate water from biomass slurries and sludge. The second innovation is the Dual Circulating Fluidized Bed (DCFB) Gasifier used for thermal gasification of the dry substrate.

VALUE PROPOSITION.

Opening the gateway to additional 1200 PJ of renewable energy from waste biomass which is currently out of scope of chemical fuels.Contributing to solve the manure and digestion residue disposal problem of large livestock farms and reducing run-off and eutrophication.Opening new opportunities for biomass gasification because of highly efficient drying at low cost.

B24 · **GasLiner** · *Poland*

Developer and producer of gas fueling equipment

GasLiner utilises its field tested, unique patented technology that can serve any type of gas and significantly reduce the cost of vehicle fuelling infrastructures. GasLiner delivers a unique product: the universal multifunctional gas fueling module, mobile and stationary, biomethane compatible and hydrogen adjustable. GasLiner's business model addresses the complete value chain of mobile gas refuelling solutions, from compressing natural gas/biomethane up to the transportation and fuelling of end users.

THE NEED. GasLiner addresses a major obstacle on a rapidly growing gas-powered vehicle market: the building cost and resulting availability of gas fuelling infrastructure. GasLiner is the only solution that eliminates the need for both the compression and the booster devices and their respective high CAPEX and recurring OPEX. The result is a significant reduction of the whole virtual pipeline cost for all kind of gaseous fuels.

THE SOLUTION. Mobile and stationary multifunctional GasLiner modules perform three functions (compression, storage, unloading) as unified devices providing low CapEx and high refuelling efficiency. Pipeline gas is replaced with a fleet of GasLiner trailers to deliver a continuous gas supply to transportation customers. The GasLiner solution enables direct customers - gas companies and fuel retailers - to reduce CAPEX of the virtual gas pipeline by 60%.

VALUE PROPOSITION.

- Low capital and operational cost.
- Highly flexible and convenient onsite fleet fueling.
- Modular and scalable.
- Turnkey cost-efficient solution.

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THE TEAM

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Co-founder, CTO

Degree in Engineering, the inventor of Multifunctional Liquid Piston Technology.

Oleg Labetski
Co-founder, MD

Degree in Philology. Has developed his professional career over 15 years in the advertising and marketing sector.

Elad Shaviv
Advisory Board Member

Holds M.Sc in Management from Boston University, and B.Sc. in EE, The Technion, The Israeli Institute of Technology. 25 years of diverse management experience, from start-ups to Fortune 500 corporations.

MARKET SEGMENTS

- Fossile natural gas

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THE TEAM

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PhD in engineering, MS of Measuring Instruments, has developed his professional career in academia and NDT&E for over 6 years.

Vladimir Kutcherov
Head of Boards

PhD, professor, has developed his professional career in academia and technology transfer for over 30 years.

MARKET SEGMENTS

- Fossile natural gas
- Gas TSO, Gas DSO
- Gas & Steam turbines

CUSTOMER REFERENCES

KTH, DVGW

B25 · **GasQual** · *Sweden*

Gas quality measurement solutions for gas grid operators, gas suppliers and the gas industry

GasQuaL AB, founded by researchers from the KTH Royal Institute of Technology, is dedicated to the development and commercialisation of GasQ Technology: an entirely new approach to gas quality measurement and control. In combining our scientific backgrounds with industry insights, we look forward to providing our future customers with an entirely novel vision and approach to measuring gas quality.

THE NEED.

On-site gas quality control has become an urgent matter in the gas industry owing to the recent liberalisation of gas markets. This has led to diversification of supply, biogas and hydrogen injections as well as the widening of permissible ranges of gas specifications in the EU.

THE SOLUTION.

Our GasQ Meter and GasQ Algorithm allow us to measure the quality characteristics of natural and biogas on-site and in real-time. Both products enable us to obtain data for gas network balancing, custody transfer, gas appliances and technological process control.

VALUE PROPOSITION.

GasQ Technology allows us to significantly decrease the CAPEX/OPEX cost of equipment for the measurement of quality characteristics of natural gas on-site, when compared to the current industry standard. It also enables us to offer a highly-customisable approach to measuring quality control of natural gas in real-time.

B26 · **Gensoric** · *Germany*

First residential power-to-liquid and CO_2 usage system

Gensoric has developed the first residential power-to-liquid and CO_2-usage system in the world. The willpower system gives everyone the possibility to produce fuel at home using surrounding resources: CO_2, H_2O and electricity. The core is a patent-protected electro-biocatalytical process technology that converts atmospheric CO_2 into methanol. The clean and easy-to-handle energy carrier, methanol, can be stored and used for heating or for electricity generation.

THE NEED.

There is a global need for decentralised energy storage at mid and small scale. The willpower system addresses this need, offering a storage capacity above the one of batteries that enables energy to be stored for days or for months.

THE SOLUTION.

Willpower's aim is substitute the use of fossil fuels for heating in all areas of life. However, private homeowners are a primary strategic target area as a mass market with huge sales potential.

VALUE PROPOSITION.

The following features provide the highest value for users:

- Genuine independence from fossil fuels; able to generate the fuel required personally and at a competitive, controlled and non-volatile cost: competitive at 6ct/kWh (natural gas price).
- Contribute to a CO_2-neutral economy – reducing CO_2 emissions at home for the good of the wider community.
- Store excess renewable energy over days and weeks will raise the economic viability of (already installed) PV systems.

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THE TEAM

Lars Krüger
CEO

Business manager at Gensoric GmbH, studied industrial engineering, MBA at HHL (Germany), EADA (Spain), and MIT Sloan School of Management Technology Entrepreneurship program. Co-founder of Gensoric GmbH, with 10 years professional experience at the company. His main areas of expertise are electrochemical and electrical technologies and devices.

MARKET SEGMENTS

- Energy storage solution for residential buildings

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THE TEAM

Caterina Coll Lozano.
Chief Operating Officer

Chemical engineer. Executive MBA at the business and marketing school ESIC. Master's degree in environmental studies. A stay at the "Institute of Technology Sligo" in Sligo (Ireland) and on the Biomass Unit at CIEMAT.

Vicent Signes Núñez
R & D Manager

Mechanical engineer. MBA at the INSEAD Fontainebleau and different Master's degrees in business. He has 40 years experience in the development and implementation of new management systems and process control.

MARKET SEGMENTS

- Municipality / District
- Industry

CUSTOMER REFERENCES

Municipality of Valencia, Barcelona/Cespa/Urbaser

B27 · **Imecal** · *Spain*

Sustainable biofuel and bioenergy from municipal solid waste

PERSEO Bioethanol® Technology has developed a completely innovative urban solid waste valorisation treatment that obtains two commercial high value products for energy use: second generation bioethanol for fuel vehicle uses, and a high calorific value solid organic fuel capable of producing heat and electricity by cogeneration.

THE NEED.

Biowaste treatment is a big issue in Europe where there is a demand for a sustainable and competitive waste treatment process (Directive 2008/98/EC). The demand for sustainable biofuels is increasing (Directive 2009/28/EC). The demand for processes that reduce GHG emissions (flagship initiative SET-Plan).

THE SOLUTION.

PERSEO Bioethanol® has developed a biotechnological process that applies in the field of MSW management and impacts directly the production of biofuels, with a reduction of GHG. The business model is based on the development of tailor made projects for each client: from design to building up.

VALUE PROPOSITION.

PERSEO Bioethanol has developed a process that is feasible, replicable and profitable:

- Development of a simple biotechnological process with good yields of bioethanol conversion.
- Process proven at semi-industrial scale: optimisation and improvement to obtain a feasible and profitable process.
- Biorefinery concept development.
- Solving sorting problems in order to guarantee a stable process.
- Better economical results than current WT technologies.

B28 · **Loreen** · *Sweden*

Commercialised by Meva Energy

Decentralised biomass cogeneration with 2nd gen biomass

The product is a turnkey power plant for cogenerated production of power and heat from biomass feedstock. The plant size is 1-5 MWe and 2-10 MWth and is based on biomass gasification and, in particular, on the utilisation of fine fraction feedstock. Meva Energy's power plant technology is suitable for industrial application and can utilise feedstock residue from wood-based manufacturing or agriculture to create a local, circular energy system with minimised transportation and distribution losses.

THE NEED.

Addressing the need of industrial-sized CHP from solid biomass, today's paradigm is to either build large-scale power plants (larger than 10 MWe) using steam turbine CHP technology, or to burn the feedstock in a boiler producing only heat.

THE SOLUTION.

Meva Energy's proposition is to enable power and heat production in the range below the commercial feasibility of steam turbine technology. The power plant comprises of a feedstock management system, an entrained flow gasification reactor and systems for gas cooling and gas cleaning. The cooled and cleaned gas is injected into a gas engine which produces power via a power generator.

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THE TEAM

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Niklas Strandberg
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MARKET SEGMENTS

- District heating grid
- Industry

CUSTOMER REFERENCES

Pite Energi

"To collaborate with start-ups is to gain in agility and to be quick on the market when developing a new offer for the customer"

Valerie Floridia-Taskin, *Innovation Director,* EDF Innovation Lab, North America

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Renewable energies

B29 · **Agronergy** · *France*

Agro-waste is converted into energy

Agronergy recycles dry agricultural by-products into agropellets in order to offer complete heating services to medium-size buildings, (such as social housing, schools, office blocks), and small industries. This innovative solution is both economical and ecological.

THE NEED.

Almost 85% of the energy consumed in France comes from non-renewable energy sources, which contributes to its expense. Three basic requirements appeared when confronting this situation: the better control and reduction of energy expenditure from heating, the reduction of CO2 emissions by using a renewable energy source, and the need for a technical solution that was easy to understand and failsafe.

THE SOLUTION.

Agronergy makes one global offer to its customers: renewable heat based on the installation of poly-fuel boilers, biomass agro-pellets that can be used as fuel, and audit and maintenance services that are customised to each specific need.

VALUE PROPOSITION.

Agronergy has developed a turnkey solution to supply renewable heat. This comes at no extra cost for the user, as there is no initial investment. What's more, there is no environmental impact, since it is a complete process based on recycling agricultural wast.

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THE TEAM

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Graduated from HEC Paris, has 15 years experience with various technical and financial functions in innovative SMEs. He created three companies successfully and initiated the AgroNergy project.

MARKET SEGMENTS

- Municipality / District

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THE TEAM

Paul O'Connor
Director

An expert in heavy oil conversion processes and refining catalysts. Several years experience in companies such as Shell, Akzo & Albe Marle. Co-founded Antecy in 2010, a company that creates the technology to convert solar energy and CO_2 from the atmosphere directly into liquid fuels and/or chemicals.

Sasa Marinic
Director

Studied law at the University of Maastricht. Co-founded Antecy in 2010, working on the conversion of solar energy and CO_2 from the atmosphere into liquid fuels.

MARKET SEGMENTS

- Biogenic & Synthetic liquid fuels
- Industry
- Energy storage solutions for the grid

B30 · **Antecy** · *Netherlands*

An economic means to capture and concentrate ambient CO_2 using renewable energy, and use it to produce fuels and chemicals

Antecy provides technology to harvest CO_2 and water from ambient air and/or flue gases in a cost-effective way, powered by solar or wind energy. The venture has developed a solid sorbent that can capture and concentrate CO_2 at 800°C, allowing the process to be efficiently integrated into many (petro)chemical processes.

THE NEED.

CO_2 is a commonly used commodity in horticulture for the production of chemicals and liquid fuels. Yet currently the production of CO_2 consumes a lot of energy, requiring temperatures of over 800°C to extract it from the air. Additionally, it often requires transportation from the factory to the site of use.

THE SOLUTION.

As capturing CO_2 is a temperature swing process, a large amount of energy can be saved when desorbing can occur at low heat. As the crucial temperature is 800°C, Antecy has developed a solid sorbent that can extract CO_2 out of the air at 800°C max. The energy that remains necessary for the process can be supplied by renewable energy sources. Since the Antecy process extracts CO_2 out of ambient air, it also enables the CO_2 to be produced onsite, cutting out the need for additional transportation.

VALUE PROPOSITION.

- Save money and energy on the production of CO_2.
- Produce CO_2 on-site and save costs on the transportation of CO_2.
- Create CO_2 out of ambient air and flue gases.

B31 · **Ari Solar** · *Spain*

A new design for solar heliostats allowing to reduce the cost of energy production

Ari Solar is a design engineering company that helps solar renewable energy projects reduce investment and operating costs through a new heliostat field design. The heliostat field consists of trackers with mounted mirrors that focus on a tower as a means of producing energy. This system enables us to reduce the cost of renewable energy production by at least 20%. Since its founding, ARI Solar has been active in more than 25 countries in 5 continents, taking part in projects which have generated up to 1 GW of power. This has provided ARI Solar with a thorough knowledge of the energy market, including the latest technologies, participating companies, interested institutions and future trends.

THE NEED. The main problem in the field of concentrated solar power is that the cost of electricity still exceeds the cost of competitive energy sources in the majority of cases.

THE SOLUTION. This solution consists of a new heliostat kinematic that adds special features to the product.

VALUE PROPOSITION. The heliostat is the core of a heliostat field. It is the unitary element that enables a field's design goals to be reached; that is, the maximum concentration of energy possible with the highest efficiency and control at receiver. The ARI Solar patented solution ("Ariostato") represents a qualitative leap in the heliostat design field. Ariostato increases heliostat field efficiency and reduces heliostat numbers; reducing the cost of control, actuators and structure, and therefore simplifying the operating and maintenance costs to obtain a reduced levelised cost of energy (LCOE).

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THE TEAM

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CEO

Pedro is an aeronautical engineer and MBA executive. He has 15 years´experiencie in business lines and project management in the energy field.

Emilio Murcia
Founding Member

Emilio is an aeronautical engineer with 15 years´experiencie in aircrafts systems multimedia training, project management in the energy field and civil engineering.

MARKET SEGMENTS

- STE
- Solar PV

CUSTOMER REFERENCES

Acciona, Ingeteam

B32 · **Arol Energy** · *France*

Biogas purification and appreciation

Arol Energy offers turnkey solutions for biogas purification articulated around proprietary products and services. Arol Energy takes responsability for design, construction and commissioning of the entire biogas purification and energy conversion processes of a methanisation project.

THE NEED.
Current biogas producers experience uncertainty in their expected return when investing in technical solutions aimed at transforming biomass into an energy resource.

THE SOLUTION.
Arol Energy offers complete technical solutions that enable biogas producers to reduce energy consumption and minimise environmental impact, while also reducing total costs over the lifespan of the project, and so improving on overall returns. Arol Energy proposes an innovative business model based on turnkey solutions, addressing both the economic and technical issues of a customer. In addition, Arol Energy has the capability to address the three conversion segments: conversion into electricity + conversion into biomethan for gas injection + conversion into biomethan for biofuel.

VALUE PROPOSITION.

- "Turnkey solutions" (the concept of the "black box"), addressing both the economic and technical issues of a customer.
- The capabilities required to address the three "conversion" segments, (electricity + gas injection + biofuel).

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THE TEAM

David Bossan
Founder and Managing Director

Solid experience in the management of small and medium-sized companies. Specialised in engineering and environmental sectors, he is competent in diverse roles in management, commercial and technical projects.

Sander Reijerkerk
Holds a Doctorate in Chemical Engineering at Arol Energy. He is responsible for all of the scientific and technical aspects of Arol's R&D and industrialisation projects in the areas of purification and energy use of biogas undertaken with our industrial and research laboratory partners.

MARKET SEGMENTS

- Biogenic & Synthetic gaseous fuels

CUSTOMER REFERENCES

BIOVALIS, Local Municipality

B33 · **BIPV Insight** · *France*

Commercialised by EnerBIM

Supporting the market for building-integrated photovoltaics

Software platform for predicting, visualising and sharing BIPV benefits.

THE NEED. As more photovoltaic (PV) developers, engineers, building developers and property owners recognise the huge potential for energy savings offered by innovative new building-integrated photovoltaics (BIPV), interest is growing fast. However, current modelling tools struggle to calculate the performance of a BIPV system; understand its impact on a building's energy performance; ensure regulatory compliance of innovative BIPV products; and collaborate with partners. EnerBIM has developed BIPV-Insight, a building information modelling (BIM) platform that overcomes these challenges, and encourages greater use of BIPV in residential, commercial and industrial buildings.

THE SOLUTION. BIPV-Insight from EnerBIM is an integrated software platform that provides easy visualisation of BIPV benefits at a building level. Its 3D modelling and instant simulations of solar power help predict the performance of BIPV and Building Applied Photovoltaics (BAPV) products, their overall impact on a building's energy performance and comfort, and likely return on investment. BIPV-Insight is available on a Software-as-a-Service (SaaS) basis. Standard services, including solar PV simulation are available free, while premium services will attract a fee. All subscribers gain an online collaborative space in which they can share projects, find solutions and partners, and showcase their references with potential partners in real time.

VALUE PROPOSITION. For architects and product designers, BIPV-Insight helps match solutions to projects, saving time and money at the design and development stage, and empowering users to become leaders in sustainable design. For building owners and property developers, BIPV-Insight's decision support provides assurance that the most appropriate BIPV products are installed and will deliver predicted energy and cost savings. In addition, BIPV-Insight gives the entire industry ready access to product catalogues, references and showcases, as well as an instant online sales and marketing channel. Current customers include Spain's Comsa-Emte Group (TMF), one of the country's largest companies in the infrastructure, service, engineering and systems sector, as well as Dutch architects and urban planners, Bear Holding BV.

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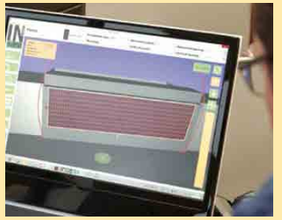

MARKET SEGMENTS

- Tertiary (non-residential) building
- Residential building
- Solar PV

B34 · **CorPower Ocean** · *Sweden*

High-efficiency wave power

An innovation based on the pumping principles of the human heart, CorPower Ocean AB has created a wave energy converter (WEC), a compact, highly-efficient product that offers five times the annual output of energy per tonne than any previously known technology. The step-change improvement in performance enables an energy cost that can compete with offshore wind in the short term, as well as established energy sources as volumes increase.
The aim is to establish a new class of highly-effective, utility scale wave power energy generators that compete with established energy sources.

THE NEED. There is an urgent need for competitive renewable energy production systems. The effective harvesting of nature's vast resource of energy harnessed in ocean waves could potentially produce 2000-4000 TWh of electricity per year - some 10-20% of the world's electricity, propelling us towards a more sustainable future fuelled by clean and economical energy.

THE SOLUTION. The key challenge is to provide a reliable means to withstand storms while, at the same time, delivering enough annual energy in relation to the system life cycle cost to make for a profitable business prospect. CorPower's devices are extremely compact and operate in resonance with incoming waves, delivering a large amount of power with small buoys. Storm survival is made possible due to a unique de-tuning mechanism that enables devices to be more resilient to incoming energy.

VALUE PROPOSITION. CorPower Ocean's technology offers exceptionally high power density; five times higher than that of competing wave power solutions. The WEC system enables utility customers to build reliable wave power farms to harvest ocean energy, with a resultant energy cost that can compete with established energy sources. Wave farms based on CPO technology require less capital investment, less ocean area, less materials, and deliver a higher annual energy output for a given generation capacity. All enabled by system efficiency and smart control.

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THE TEAM

Patrik Möller
CEO

Entrepreneur and technologist with experience in co-founding and running venture-financed companies in the renewable energy and semiconductor technology space. Passionate about creating game-changing products from innovative ideas.

Stig Lundbäck
Founder and Senior Technologist

CorPower founder Stig Lundbäck, MD, spent most of his life studying the pumping principles of the human heart. He invented the Dynamic Adaptive Piston Pump Technology (DAPPT) in 1984, and used his comprehensive knowledge to imagine and construct a Wave Energy Converter based on similar principles.

MARKET SEGMENTS

- Ocean energy

B35 · **CYSALYS Technologies** · *France*

Smart hybrid power solutions dedicated to off-grid and bad-grid telecom sites

CYSALYS designs green smart power products and features aimed at mobile operators in emerging countries, in order to help them to reduce their operational costs and environmental footprint. CYSALYS also offers other services, such as on-site installation of their Smart Hybrid Units, training for installation and maintenance of their units, and audit of optimisation of telecom energy solutions.

THE NEED. In emerging countries, the commercial electricity network is either not sufficiently developed or failing. Mobile operators use fuel generators to power their mobile sites. Operating costs are very high (fuel consumption, maintenance, ...), and many network failures occur owing to these generators. What's more, fuel is subject to theft and fraud.

THE SOLUTION. CYSALYS offers an independent power supply unit dedicated to mobile telecom relays in emerging countries. Our Smart Hybrid Power Unit is secured and allows to reduce significantly operating costs. It integrates patented technological innovations which improve the hybrid efficiency, and also value-added services, such as the recharging of mobile handsets.

VALUE PROPOSITION.

- CYSALYS' Smart Hybrid Power Unit's highlights:
All-in-one compact hybrid power unit (including PV panels). Modular and evolutive conception. Theft and fraud securization. Local embedded management and remote supervision. Easy to ship and to install on site.
- Our SHP-U allows to:
Reduce significantly diesel consumption (hybrid efficiency). Reduce on site maintenance operations (6 months autonomy). While securing the power source.
- Offering:
A reliable energy source. A cost effective solution (ROI < 1 year). An environment-friendly power unit.

The SHP-Unit is also offering a new dimension : "eco-citizens" services for local populations, such as a refilling module for mobile handsets, internet consultation screen, ...

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QOWISIO, represented by Cyrille Le Floch
Co-Founder

MARKET SEGMENTS

- Off grid

B36 · **Compact Solar** · *Netherlands*

A small modular system that can harvest solar energy from flat roofs

Compact Solar is a small light-weight solar cell modular system especially developed for use on flat roofs and smaller surfaces. It enables more solar energy to be harvested in built environments and urban areas. The system allows every available flat roof surface to be used for the generation of solar power. Because of its low height, the system is invisible to passers-by and can even be installed on monuments.

THE NEED. The existing built environment has only limited space for solar panels and non-shaded areas are rare. Furthermore, currently used systems are complex and relatively large and heavy, making them difficult for consumers to apply on small roofs. For flat roofs, no solutions exist.

THE SOLUTION. The Compact Solar system is composed of several small modules of a few solar cells each. These are connected to form a full energy production system. Thanks to the modular design, any roof surface can be used to its fullest extent. Each module contains the necessary internal wiring and an energy conversion and optimisation unit, reducing the negative effects of shading on the system as each module works separately from the others.

VALUE PROPOSITION.

- Suitable for every available flat roof surface, small or big, strong or weak: Small size modules. Light-weight.
- Less sensitive to shadow than regular systems.
Each module contains: Necessary internal wiring. Energy conversion and optimisation unit.
- Quick and cheap manufacturing.
- Overlapping structure to create one single windproof system.
- Low height to make it invisible to passers-by.
- Easy to install and maintain.

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THE TEAM

Floris Bruning
CEO
Highly experienced in the application of solar technologies and the creation of viable business cases in the Dutch market, including detailed knowledge of the ever-changing Dutch energy legislation.

MARKET SEGMENTS

- Residential building

B37 · **Deltalys** · *France*

Turnkey, innovative, eco-efficient solutions for renewable gas treatment

Deltalys develops, commercialises and operates eco-efficient solutions for renewable gas treatment. Solutions include: improved processes, dedicated digital solutions and an innovative business approach that enables industrial gas producers to enhance sites profitably, while lowering the operational risks linked to gas processing. These integrated solutions, based on a circular-economy approach, amount to a huge reduction in carbon footprint while reinforcing a local, decentralised waste-to-energy value chain.

THE NEED. While the need for clean and sustainable energy is universally recognised, the growth rates of such sectors is restricted by uncertainties regarding its long-term profitability. The renewable gas sector is no exception.

As renewable gases (biogas, syngas) are produced from organic material they naturally contain high levels of contaminants that need to be removed from raw gas for optimal valorisation. The decontamination process is complex, costly and has a high carbon footprint - this has a major impact on the profitability of production sites.

THE SOLUTION. Deltalys has developed turnkey gas processing solutions based on more than 10 years of academic research. They integrate a patented eco-efficient process, modular plug and play modules and advanced digital tools.

VALUE PROPOSITION. Deltalys' smart, cost-effective and eco-friendly solutions deliver clients the key technology to make industrial renewable gas production sites really competitive. Benefits include:

- Optimal and secured profitability.
- Minimum operational risks.
- Enhanced environmental performance.

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THE TEAM

Charly GERMAIN
CEO

Generalist Degree in Engineering. More than 8 years experience working in different positions in the energy sector (R&D, Project, Offers) before diving into entrepreneurship, innovation in sustainable energy a major motivating factor.

MARKET SEGMENTS

- Biogenic & Synthetic gaseous fuels

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THE TEAM

Brice Cruchon
CEO Scientist

Through 20 years of professional experience he has acquired expertise in running and guiding innovation projects. He has worked with products of mass consumption as well as in industry.

Pascal Pierron
CTO

Expert inkjet digital printing and nanotechnology. Experience with SMEs and startups. Co-hosts the scientific committee.

MARKET SEGMENTS

- Solar PV
- Smart energy efficient mobility
- Industry

CUSTOMER REFERENCES

Babolat, Vossloh, Grosfillex

B38 · **Dracula Technologies** · *France*

Energy autonomy for mobile products

Dracula Technologies uses a source of renewable energy and integrates this technology into many everyday mobile products. The aim is that new products are given the ability to produce light and energy without their primary function being changed, such devices becoming energetically autonomous.

THE NEED.
By 2020, some 50 billion devices will be connected. This amounts to more than $1.9 trillion (€1.75 trillion), with energy representing some 12% of this turnover. There is an urgent market need to find solutions to power up these devices sustainably while also prolonging their lifespan.

THE SOLUTION.
Dracula Technologies has developed printed, flexible solar cells that fit perfectly into the design of each product. Once these solar cells are fitted, they enable small devices, such as phones, GPS, lamps, etc. to produce enough power to recharge themselves. The strong points of our sensor are: autonomy, health and security.

VALUE PROPOSITION.
Dracula Technologies proposes the following to its clients: "Endow your products – whatever their shape, size and material – with solar power". The company offers to produce organic photovoltaic modules that are based on the product materials used by a client. These materials are provided with an autonomous means to provide light and energy, without compromising a product's initial function. Organic photovoltaic, through digital printing, will appeal to clients for whom slight thickness, lightness, suppleness/flexibility, transparency, capacity to take very various shapes and indoor-outdoor portability, are important factors.

B39 · **Ecoligo** · *Germany*

A solar utility designed for emerging markets

The solar utility, ecoligo, provides low-cost solar energy to local businesses in developing countries. Projects are financed through an investment platform, where ecoligo offers attractive and tangible projects with a fixed interest rate to private investors. Investments in the projects on ecoligo's platform are not only profitable, but also support economic development and reduce CO2 emissions.

THE NEED.

Local businesses in developing countries face high electricity costs and lack a stable power supply. Solar energy systems provide the solution to these issues, but owing to the economic difficulties such countries face, finding finance for such systems can be difficult.

THE SOLUTION.

In providing low cost solar energy to local businesses, ecoligo saves them up to 40% on their energy costs. By financing the projects via a crowd investment platform, ecoligo closes the finance gap while providing attractive returns to private investors.

VALUE PROPOSITION.

Solar energy can be offered at a 40% lower rate than local utilities or other solar power providers due to ecoligo's low cost of capital. As ecoligo operates the projects, risks can be managed much more effectively than in the case of other crowd investment platforms that have similar projects but are not involved in their implementation.

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THE TEAM

Martin Baart
Co-founder & CFO

Martin is a technical expert in microgrid technologies and business development for renewables in developing countries. He has previous experience in building businesses and teams for large companies and start-ups.

Markus Schwaninger
Co-founder & CFO

Markus has worked for several years for the German development cooperation with a focus on business models and sustainable energy market development in developing countries.

MARKET SEGMENTS

- Solar PV

B40 · **Endef** · *Spain*

Hybrid technology to produce electricity and heat simultaneously in a single solar panel

ECOMESH panels simultaneously produce electricity and heat, thereby generating the same energy as conventional thermal and photovoltaic panels separately while reducing the collecting surface by 40%. Additionally, unlike existing hybrid panels on the market, panels increase electricity generation by 15% due to heat dissipation that allows the panels to operate at an optimum temperature, and triples thermal output at elevated temperatures.

THE NEED.

The reduction of the collecting surface make the residential sector a clear target, yet significant energy savings can also be obtained in businesses where hot water and electricity consumption takes place, such as pools or industries.

THE SOLUTION.

The ECOMESH panel reduces the collecting surface by 40% thanks to the combined production of electricity and heat in a single panel. Additionally, it increases electricity production by 15% as well as tripling thermal output due to the Transparent Insulation Cover (TIC).

VALUE PROPOSITION.

This product provides a means to obtain zero-emission buildings. Apart from contributing to environmental protection, it allows for energy savings as it produces electricity and heat simultaneously in a single panel with very high efficiency. In addition, it reduces the payback period without subsidies thanks to the economic value of simultaneous generation of energy along with improved efficiency.

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THE TEAM

Isabel Guedea
Executive Director

Alejandro del Amo
Technical Director

Gonzalo Brun
Director of Operations

MARKET SEGMENTS

- Tertiary (non-residential) building
- Residential building
- Heating & Cooling

B41 · **Energy Floors** · *Netherlands*

Floor systems for high footfall areas that convert pedestrian energy into electricity

Energy Floors develops, sells and rents innovative floor systems that convert kinetic energy created by pedestrian footfall into electricity. Our floors can be integrated into pavements and high footfall areas, such as city areas, schools, airports, railway stations, shopping malls and office entrances, with the energy created used to power local devices. Through on-site interaction, Energy Floors provides feedback on the energy generated, raising awareness of clean energy production.

THE NEED.

Raising awareness of energy production and energy consumption is an important element in the fight against climate change. People need to be engaged and effectively educated in the use of renewable energy and in how to reduce carbon footprint.

THE SOLUTION.

Energy Floors offers a tool to produce local clean energy and educate at the same time by means of a Hybrid Energy Floor. This floor converts kinetic and solar power into electricity, which can be used to power educational energy games, lighting and usb devices.

VALUE PROPOSITION.

The Hybrid Energy Floor is practical, educational and fun. It is aesthetically attractive, meets sustainability targets and provides interactive learning about renewable energy production. The energy generated can power informative content and educational games, lighting or personal devices. It places schools, companies and governments at the forefront of energy education and clean energy production.

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THE TEAM

Trude Buitenhuis
Business Development Manager
Master's degree in Applied Physics and Marketing (NIMA A and B). Has successfully created new businesses and managed international projects in the telecom, educational and clean-tech sectors.

MARKET SEGMENTS

- Tertiary (non-residential) building
- Solar PV

CUSTOMER REFERENCES

Municipality Rotterdam, InterfaceFlor, DuraVermeer, wUrck

B42 · **Enetech** · *Poland*

Heat storage and transport systems

A heat storage and transportation system that enables the storage of thermal energy in tanks filled with phase change materials (PCM). As tanks are able to be transported, the system allows thermal energy to be moved from one place to another without an expensive heating network. The system allows storage of even low-parameter heat at temperatures as low as a few tens of degrees Celsius.

THE NEED.

In the Polish industry alone, some 60 TWh of heat energy is lost annually in the form of waste heat. Due to its nature (low-parameter energy) it is not possible to effectively manage this amount of energy.

THE SOLUTION.

Enetech's system allows waste heat energy to be utilised and transported around without the need of high cost investments in the traditional heating network.

VALUE PROPOSITION.

- Possibility to manage waste heat energy in industry and earn money on it instead of wasting it.
- Gaining new customers for heat energy in small CHP and biogas plants.
- Possibility to make heat production independent from electricity production in small CHP (maximising of electricity production volume during peak demand).

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THE TEAM

Mateusz Lisowski
CEO
Ph.D. degree in Automatics and Robotics, one year as head of Enetech, involved in six R&D projects during his career in the area of passive wireless sensors, heat storage and transport systems.

Michal Lubieniecki
Ph.D. degree in Automatics and Robotics, wide experience in energy-oriented projects with expertise in waste energy recovery and usage.

MARKET SEGMENTS

- Heating & Cooling
- Energy storage solutions for the grid
- District heating grid

CUSTOMER REFERENCES

MPWiK

B43 · **EnOware** · *Germany*

Mobile sensor systems for fluid applications including energy and environment monitoring

enOware is developing sensors for fluid applications. The main elements include a mobile miniaturised sensor, a read-out and charging bypass, a monitoring portal and a professional validation kit to ensure the integrity of the probe during erection. The first application is geothermal probes. Further applications could be environmental, such as in water systems, in bio-gas or in bio-pharma.

THE NEED. Geothermal probes have no solution for continuously monitoring the internal condition of the probe. In situ monitoring can be used to optimise efficiency of the system as well as monitoring the overall state of the probe, enabling alarms to be triggered in case of malfunction or geological problems.

THE SOLUTION. enOware offers a miniature pig measurement solution for geothermal probes. By measuring temperature and pressure throughout the system, rather than just input and output with no knowledge of the location, both the state of the probe and location of faults can be localised.

VALUE PROPOSITION. Wireless communication and charging of the fully enclosed measurement pig (20 mm diameter) enables in situ monitoring and measurements. Because of their compact size and geometry, our sensors can be installed at any accessible point of the system without its partial demolition, which can be costly. This enables new instalments without increased planning input. It also enables easy refits in existing probes that can inspect the state of the application and monitor its energy efficiency.

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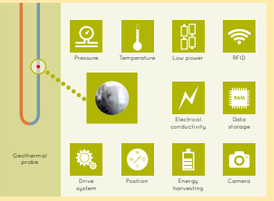

THE TEAM

Karl G. Linder
Managing Director
Entrepreneur and 25 years experience

Simeon Meier
Managing Partner
Experienced R+D manager

Philipp Linder
Managing Partner
Mechatronic and renewables experience

MARKET SEGMENTS

- Geothermal electricity

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THE TEAM

Rajai Aghabi
CEO Eolos

Carles Gayán
CTO Eolos

MARKET SEGMENTS

- Offshore wind

B44 · **Eolos** · *Spain*

Tackling the current challenges of offshore wind measurements

THE NEED.
Offshore wind farm investments need reliable wind assessments in order to estimate the wind energy potential of the site where the wind turbines are to be installed. Performing wind assessments with no high quality on-site data increases uncertainty, hindering the project's bankability and increasing the financial risks of the project. The current costs for performing offshore on-site wind measurements is very high, as it includes the installation of costly bottom fixed met masts. Additionally, these systems are stationary, only allowing them to take measurements at a single coordinate point.

THE SOLUTION.
Eolos Lidar buoy offers a low cost, accurate and reliable offshore wind data source, allowing for the performance of measurements at heights of more than 200m above sea level, and at much lower costs (up to 10 times less) than conventional bottom-fixed offshore met masts. In addition, it offers positional flexibility and can be reused in other areas within a wind farm site (or on other sites), potentially reducing the uncertainties of wind speed measurement.

VALUE PROPOSITION.
Eolos's competitive advantage relies on the precision, availability and completeness of data acquisition as well as its sturdy and optimised structure designed to withstand offshore operations and, at the same time, ease its transportation. It also offers an advanced data processing tool based on a purposely-developed wind, wave and current combined numerical model, providing an integral solution for the current challenges of offshore wind assessment.

B45 · **EPC Solaire** · *France*

Heat recovery supports for standard photovoltaic panels for large industrial, commercial or agricultural roofs

The best photovoltaic module (PV) in the world can provide 22% yield. This means 78% is lost, mainly through heat. Our solution allows for the recovery of heat dissipated by a conventional photovoltaic module: this can offer up to twice the overall energy efficiency!

THE NEED. With the decreasing and, probably, the eventual disappearance of the feed in tariff of PV electricity, the photovoltaic market is moving toward self-consumption. Yet the investment return is still low, particularly in countries like France (with its low standard electricity price) or in northern Europe, (due to low irradiation). Developers are waiting for solutions that are able to increase the IRR of the projects.

THE SOLUTION. Our solution allows for the recovery of heat that is dissipated by a conventional photovoltaic module. The hot air collected can be used for: Heating the building in winter, heating water in summer, drying processes (cereals, tiles, wood ...).

VALUE PROPOSITION. After two years of R&D in collaboration with the University of Lyon, EPC Solar presents the hybrid iNovaPVT and iNovaBacPVT, mounting structures specially designed for heat recovery for PV modules that are dedicated to large commercial flat mounting roofs, or industrial and agricultural tilted roofs. Furthermore, EPC Solar has developed the dedicated software iNovaSunSoft, able to predict the efficiency of the solution in the process or in the buildings of its customers. Overall energy efficiency can be up to twice as efficient as before!

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THE TEAM

Gerard Challeyssin
Chairman

Electronic engineer, Gérard Chaleyssin has developed his professional career in the electronics sector for 20 years in different positions in sales departments and as CEO.

Jean Paul Bousquet
CEO

Graduated with a Master degree in science, microelectronics + MBA, has developed his professional career in the electronics sector for 15 years and renewable energy for 5 years, in different positions in sales departments, marketing and product development.

MARKET SEGMENTS

- Tertiary (non-residential) building
- Residential building
- Solar PV
- Heating & Cooling

CUSTOMER REFERENCES

Edf, Bouygues, Armorgreen

B46 · **Gramma** · *Italy*

Agroenergetic solutions, based on the High Agricultural Yield PV Greenhouse

The innovative characteristic of the Gramma PV Greenhouse is that it allow for the installation of a significant amount of PV power whilst at least matching the full agricultural potential of a non-PV greenhouse. We currently have in excess of 10Ha constructed or in construction ranging from the North of Germany to the South of Italy.

THE NEED.
Due to harsher weather conditions and increasing competition, agricultural margins are declining despite the growing demand for agricultural products. We provide innovative solutions that allow farming businesses to diversify income streams, without compromising their agricultural output.

THE SOLUTION.
We provide an advanced greenhouse design (intensive farming) with an asymmetrical roof, which manages to separate the portion used for agriculture (allowing 90% of light to reach the cultivated surface) from the part used to produce electricity. As a result, both activities can achieve optimum yields.

VALUE PROPOSITION.
We are the only PV greenhouse supplier that has experimentally shown it can exceed agricultural yields of non-PV greenhouses. We have industrialised our solution bringing its costs in line with traditional greenhouses. Therefore, energy investors can achieve higher returns, adding the agricultural income stream to energy production, and advanced farming activities can diversify and increase margins (the return on equity of selling electricity is higher than most farming business).

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THE TEAM

Jacopo_Rubbia
Co-Founde and CEO

Responsible for the marketing activities in Italy. He was one of the co-founders of PRV Energy and previously worked for 7 years in finance in London. Graduated in computer engineering in the Politecnico di Milano.

MARKET SEGMENTS

- Solar PV

B47 · **Koalalifter** · *Spain*

Innovative equipment for exchanging the main components of wind turbine generators without the need of a crane

Leunamme Technology is developing a commercial product registered as the Koalalifter. Koalalifter is equipment that enables the exchange of blades and generators in wind turbine generators (WTG) of over 1MW, onshore and offshore, without the need of a high tonnage crane. The robust Koalalifter hugs the tower of the WTG to provide highly reliable and safe operative value during the whole procedure. Koalalifter can operate in winds of up to 12 m/s, reducing the WTG downtime. In addition to avoiding using a high tonnage crane, Koalalifter can travel together with the blade transportation and can be operated by 4 operators, reducing the cost of the corrective procedure drastically.

THE NEED. For costs to be reduced and production to increase, there is a need to provide an alternative solution to high tonnage cranes used for the exchange of large components in WTG. The problem with using cranes is their limited availability, their restrictions when it comes to operating in winds of over 6-7 m/s for such loads, as well as their huge asset cost.

THE SOLUTION. A disruptive lifting device that uses the strength of the tower as its support.

VALUE PROPOSITION. The Koalalifter is a significantly more economical solution than using high tonnage cranes. It also offers the advantage of being operational in 5 m/s stronger winds.

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THE TEAM

Emmanuel García de la Peña
CEO

Industrial engineer with Master in Industrial Organisation from the University of Navarra. Master in Business Administration at IESE.

CUSTOMER REFERENCES

Availon, Ingeteam Services, Tamoin, EDF RE, Acciona, Nextera, Siemens, Vestas

B48 · **HWR-Energie** · *Germany*

Wind energy plants that use innovative technology to generate power through high-altitude winds

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THE TEAM

Bernhard Miller
Founder

Worked in advance development at Robert Bosch GmbH and Knorr-Bremse SfN for 26 years. Additionally, since 1995 he has owned a company in development, production and distribution: www.miller-energiesparsysteme.de

Firstly, a prototype is created by external award of contract. After the proof of concept, the product is ready for series production. The business will then be operated with a partner: be this with the involvement of a strategist within the company or by licensing out to an external strategist. Together with the strategists, the distribution channels (b2b) can be built. The company then generates income through sales of the product to wind farm operators.

THE NEED. The further expansion of wind power is faced with increasing resistance and rejection. This is due to deterioration of landscape view, limited site selection, as well as high production costs, that prevent economic operation without subsidies. Therefore, further expansion of wind power is currently politically curbed.

THE SOLUTION. A high-altitude wind power plant is in development that uses the high energy density of strong winds. Based on similar principles as flying a kite, energy can be generated by cyclically veering and hauling a group of contiguous rotating impellers that are connected via traction cables to their respective ground stations.

VALUE PROPOSITION.

- 70 % more favourable manufacturing costs.
- Low impact on the landscape image (smaller impeller diameter, high altitude).
- Free choice of location allows operating in proximity to the consumer (no power lines necessary).
- Offshore use also in deep water.
- Extremely robust thanks to simple function concept.
- System start even without wind near the ground.
- Significantly higher plant density: Three-dimensional airspace. Precise positioning of the impeller.

B49 · **Nano Technology Solar** · *Germany*

Increasing significantly the efficiency of PV solar cells and modules by improving photon-management

NTS is focused on nanotechnology development. Wecurrently have 3 technologies in development that will give an innovative improvement to photon management, significantly increasing the efficiency of photovoltaic cells and modules. The most advanced of our technologies is our functional surface (FS) on PV cells.

THE NEED. The photovoltaic market demands permanently two things: a significant increase of efficiency, and a reduction of costs of PV cells and modules (in ct / W). Our technology "functional surface" is placed in a separate process step (upgrade of existing production lines possible) implemented in the production line of PV cells and increases the efficiency of the cells by about 10%.

THE SOLUTION. Our patented technology of functional surface (FS) is implemented in the production of the solar cell and leads to increase of cell efficiency of about 10%. This leads to a quantitative increase in revenue of 10%, as the price is formed performance oriented in ct / W. In addition, the cells produced now belong to a higher performance class and generate additional quality revenues by a higher price in ct / W.

VALUE PROPOSITION. The current standard micro-structuring (pyramids) of the PV cell surface is replaced by our nano-structured functional surface. The functional surface (FS) works with (optimised in simulations) optical (nano) antennas designed by us. These nano-antennas couple well the whole sunlight spectrum (from 280 nm to 1100 nm wavelength) broadband in the cell and keep the photons longer in the cell as the microstructures used so far, because the nano-antennas catch the non-absorbed light in the cell and radiate it back into the cell. This leads to an increase in efficiency of the PV cell by about 10%.

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THE TEAM

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Jörg Andreas Merlein
Managing Director; Founder

PhD at the chair of Prof. Dr. Leitenstorfer at the University of Konstanz: "Femtosecond Quantum Optics with Solid State Nanostructures".

Marian Neusser
Managing Director; Founder

Diploma in mathematics; IT-specialist mainframe and database systems at Siemens AG. Account manager for research and education at Siemens AG IT. Independent sales representative in financial services.

MARKET SEGMENTS

- Solar PV

B50 · **Nnergix** · *Spain*

Renewable energy forecasting and micro smart grid management solutions

Nnergix helps energy traders, grid/market operators, self-consumption owners and plant managers integrate renewable energy production in the power grid, offering diverse, accurate forecast solutions using Big Data from the industry. Nnergix's technology uses cutting-edge solutions to mix satellite weather data with energy production values through customised solution and specific monitoring designed for energy integration purposes. Everything is available online and worldwide.

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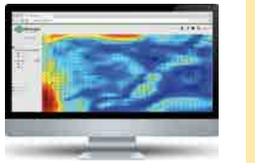

THE TEAM

Ramon Molera
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Joan Miquel Anglès
Co-Founder and Business Development Manager

Jordi Vidal de Llobatera
Co-Founder and CTO

Albert Comelles
Data Analyst

Juan Álvarez de Toledo
Business Developer

MARKET SEGMENTS

- Power TSO
- Power DSO

THE NEED.

Due to the complexity of renewable energy resources and its dependence on changeable weather conditions, companies need to predict their energy production in order to integrate it correctly and efficiently, while reducing economic costs.

THE SOLUTION.

Renewable energies are clean and endless but hard to deal with due to their unpredictability. Nnergix provides cloud-based software as a tool that easily integrates and displays key information from the electricity market. Our solution allows us to forecast short-term availability of solar and wind power production and monitoring, creating essential information for self-consumption, electricity grid and supply management.

VALUE PROPOSITION.

- High accuracy forecasts and customisation.
- Monitoring solutions designed especially for electricity grid integration purposes.
- Accuracy and imbalance penalties follow-up through monitoring and web-based tools.
- Variable billing depending on accuracy.

B51 · **Permavit** · *Germany*

Highly efficient and maintenance-free small wind turbines for energy generation

Permavit GmbH is contributing to the steady development of renewable energies in their taking on greater significance. By providing innovative solutions in the form of novel small wind turbines, Permavit delivers an affordable maintenance-free and noiseless platform for developing wind energy. These batch-fabricated, highly efficient turbines enable the customer to purchase an independent source of renewable energy that amortises in less than 10 years.

THE NEED. Permavit aims at fulfilling the need to produce enough energy in areas with low wind appearance by noiseless operation. Wind energy therefore complements other sources of energy towards being 100% self-sufficient.

THE SOLUTION. The innovative cladding construction and the elaborate geometric assembly enable noiseless energy generation. Clever electronic control systems and surge protection in Permavit's turbines contributes to power supply without any carbon emission.

VALUE PROPOSITION. As the innovative construction of Permavit's small wind turbines does not require any mechanics controlling the moving parts of the turbine, there is no maintenance required at all. Additionally, the lightweight construction of the rotor ensures a high degree of responsive qualities. The cladding construction avoids rotor blade noise and prevents the risk of striking birds.

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THE TEAM

Urwalek, Martin
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Dressel, Stephan
Manager

Weichselbaum, Joachim
Chief designer

MARKET SEGMENTS

- Onshore wind
- Residential building
- Off grid

B52 · **Powcell** · *France*

Commercialised by S'Tile

Powder substrate based photovoltaic cells

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THE TEAM

Alain Straboni
Project manager

MARKET SEGMENTS

- Solar PV
- Off grid

THE NEED.

Production costs of PV cells still need to decrease to allow massive deployment of Solar Photovoltaic Electricity. In PV industry, high costs are due to the high capital expenditure of the manufacturing steps: the production of pure silicon, and the cutting of ingot into wafers. Wafering costs represent around half of the cost of a photovoltaic module. Furthermore these two processes are energyconsuming, and have a high environmental impact:

- High consumption of chloride acid and solvent.
- 60% of silicon material spoiled during the process.

Innovative technologies for PV cell manufacturing are expected to decrease the price of photovoltaic electricity in € per Watt. European PV manufacturers also need to recover competitiveness through innovative, low-cost production techniques.

THE SOLUTION.

The Powcell project focuses on the low cost production of the Crystalline Silicon Thin-Film solar cell and will develop a new pilot line of 15 MW. This innovative technology, relying on die-pressed and sintered wafers from metallic grade powders, combines both the strengths of wafer and thin-film technologies.

The aim is to reach:

- Energy conversion efficiencies beyond 16%
- Wafer cost under 0.2 c€/W
- Cost of watt-peak: 0.5 €/Wp

This project also allows:

- To decrease the energy consumption of PV cell fabrication by a factor 2.
- To mitigate the environmental impact and to reduce the chemical consumption to a minimum.

B53 · **Pro-Drone** · *Portugal*

Aerial inspections of energy infrastructure

Pro-Drone develops technologies to carry out the inspection of energy infrastructures, using cost-efficient, robust and automated airborne solutions. We are focused on solutions for wind turbine blade inspections, particularly offshore, and transmission lines. Our approach is integrated and involves a customised hardware platform, tuning flight algorithms, specific sensors and tailored post-processing software that can streamline and automate the process.

THE NEED.
The renewable energy field in general, and wind in particular, is looking for ways to lower OPEX costs and, as a result, long term margins to keep it competitive. Inspections to date have remained essentially as expensive, complex and reliant on specialist intervention as before, which makes the area one with a huge potential for improvement.

THE SOLUTION.
Pro-Drone has an integrated approach to aerial inspections, drawing from the best technologies available to provide high quality and robust reports. We customise the whole process, including the UAV's, the sensors they carry and the whole post-processing of the data recovered, in order to deliver unparalleled results.UAVs offer a whole new range of solutions that can make inspection operations more efficient, safe and automated.

VALUE PROPOSITION.
Our solution stands out for the reliability, quality and automation that it offers. By controlling and integrating the whole process, from data acquisition to report generation, we can significantly streamline the inspection process and offer a more efficient and robust technology. This translates into gains in time, quality and robustness of the services provided, offering a differentiated and effective solution to our customers.

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THE TEAM

André Moura
CEO

André has been working in the renewable energy sector for over 6 years developing and implementing solutions to help drive down their O&M costs. He has an entrepreneurial 'can-do' attitude and experience in technological management and product development.

Tiago Ferreira
Engineer

MARKET SEGMENTS

- Onshore and Offshore wind
- Hydro
- Industry

CUSTOMER REFERENCES

EDP Renewables, Generg

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THE TEAM

Jordi Cusidó i Roura
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Jordi holds a PhD in Industrial Engineering from the Universitat Politècnica de Catalunya. He submitted his thesis on the study of signal processing techniques for the diagnosis of rotating electrical machines.

David Amoros Alcaraz
CTO

David holds a degree in Computing from the Universitat Politècnica de Catalunya (1996) and has over 15 years experience in the management, definition and development of expert systems and data provision, especially in the health sector.

MARKET SEGMENTS

- Onshore and Offshore wind

B54 · **Smartive** · *Spain*

Advanced IoT cloud solutions to monitor, diagnose and control wind turbines

Smartive develops IT solutions for the energy market. It provides advanced services of real-time SCADA data processing to diagnose windmills and focus on the development of low cost diagnosis systems based on cloud computing, smart devices and real-time data processing. Smartive provides access to IT platforms allowing the supervision, monitoring, diagnosis and prognosis of the performance of wind turbines. By means of smart devices (smartphones and tablets) we provide solutions to not only improve the performance of a wind turbine but also to plan maintenance operations, as well as obtain online information about the machine and the components.

THE NEED. At least 3% of wind turbines have production downtime due to breakdowns and maintenance problems. In some wind farms, this can affect some 10-15% of turbines and in extreme cases up to 30%. This high number of incidents leads to global production losses of over €2.9 billion annually. That means that a standard wind farm of 50 MW of installation power and 2,100 hours of annual power production can face production losses of between €378,000 and €5 million annually.

THE SOLUTION. SmartCast remotely connects SCADA and sensor data with a virtual database to monitor wind turbines (see graph). It involves algorithms currently based on SVM, cloud computing and data mining. IoT (Internet of Things) technologies have been also introduced to allow real-time online monitoring and control.

VALUE PROPOSITION. This innovative solution – a combination of our SmartGear and SmartCast products - allows faster detection of turbine system failures. It does so through complex algorithms that implement intelligent sensor fusion therefore optimising the performance of wind turbines. In contrast to our competitors, this does not require onsite visits as all information is provided online.

B55 · **DeepGreen500** · *Sweden*

Commercialised by Minesto

Converts renewable energy from tidal and ocean currents into electricity via a novel principle

THE NEED.

The ocean is one of the least exploited, yet at the same time, largest renewable energy source on Earth. Tidal and ocean currents remains a substantial advantage over other renewable sources; they are rich in energy, timeless, predictable, reliable and it exists across the globe. The marine energy industry, focusing on wave and tidal, experienced a breakthrough in 2010. Thousands of megawatts have been announced for installation and financed in the UK, China, India and Canada. The tidal energy technologies available today, i.e. first generation, are designed for high speed locations. This related to areas with current velocity higher than 2.4 m/s. These sites contain massive amounts of energy, but their geographical footprints are limited and due to the storng water currents, the sites are difficult to operate in. In general, all other sea users avoid these areas due to the harsh and unfriendly work environment.

THE SOLUTION.

DeepGreen500´s technology converts renewable energy from tidal and ocean currents into electricity via a novel principle, somewhat similar to the posture of a wind kite. The kite assembly, consisting of a wing and turbine, is attached by a tether to a fixed point on the ocean bed. As water flows over the wing, the water current creates a lift force on the wing that pushes the kite forward. The kite is steered in a 8-shaped trajectory by a rudder and reaches a speed 10 times that of the water´s. As the kite moves, water flows through the turbine and electricity is produced in a gearless generator.
DeepGreen500 offers a solution for harvesting energy from tidal and ocean currents, in harmony with marine eco system, with a low average cost of energy (COE). Also, DeepGreen500 offers a unique site access by leveraging low velocity tides with higher availability, providing great commercial potential in much wider geographical locations. Finally, it makes it possible for customers to diversify their green energy portfolio while reducing their cost of energy.

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THE TEAM

Björn Häggendal
Project Manager

MARKET SEGMENTS

- Ocean

B56 · **Solable** · *France*

Renewable innovations to boost the solar market meeting domestic and collective targets around the world

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THE TEAM

Pascal Nuti
CRO

A self-made energy expert with 20 years experience, highly skilled in embedded electronics, IT, a specialist in the manufacturing industry.

Saadi Brahmi
CEO

High school engineer, highly skilled in prototyping, mechanics, photovoltaic, machining.

MARKET SEGMENTS

- Tertiary (non-residential) building
- Residential building

THE NEED.

Affordable solar thermal systems, Hybrid solar for masses, Free smart “IoT” features in the package.

THE SOLUTION.

We have developed non-pressurised, moulded, highly insulated hot water storage systems, with or without an integrated solar panel. We have also patented a very useful PV-T system, with an add-on cost of just 0.1€/watt peak for a standard PV panel, which is able to output around 1Kw of thermal power on a regular 250w solar photovoltaic panel. By coupling these items, we will soon be able to propose the simplest and most efficient solar production system available, cutting installation prices by a 2x factor. This will permit an immediate return on investment for solar hybrid and thermal systems.

VALUE PROPOSITION.

- A solar system with a very short return on investment, able to supply hot water, electricity, or both.
- A low cost proposition.
- Easy to install, easy to maintain, minimal thermal leaks.
- High-end life duration, very easy to recycle.

B57 · **Solar Energy Booster** · *Netherlands*

Add-on that converts photovoltaic systems into thermal hybrid solar collectors

Solar Energy Booster adds a heat collector to traditional electric solar panels. Not only does the venture provide the tubes and couplings, but they also insulate the exchanger if needed. Careful calculations ensure that the combination of heat exchanger and PV panel captures the maximum energy possible out of the solar installation.

THE NEED.

Traditional solar energy panels are not able to put all the energy that can be captured from the sun to use; a substantial amount of heat still needs to be ventilated from the panels. Ideally, this 'wasted' heat can also be used as energy in the building, yet adding heat collectors to already installed PV panels is often expensive, and needs customised solutions.

THE SOLUTION.

Solar Energy Booster offers an add-on to already installed electrical PV systems. This solution can be fitted to 85% of existing panels at a reasonable cost.

VALUE PROPOSITION.

- Universally applicable – the system fits to up to 85% of the existing PV panels by a variety of manufacturers.
- Easy to install.
- Can be added on to existing and installed PV installations.
- Financially attractive solution in comparison to other photovoltaic thermal hybrid systems.

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THE TEAM

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CEO

Mr. Harter has developed his professional career in the energy sector for 7 years.

Wolfgang Ackenhausen
CTO

Karl-Friedrich Harter developed his professional career in the energy sector since for 7 years and Wolfgang Ackenhausen is an technical expert in the area of photovoltaics for more than 10 years, working in different positions in sales departments, marketing and product development.

MARKET SEGMENTS

- Solar PV

B58 · **Solardynamik** · *Germany*

Renewable energy with a focus on efficient carrier systems for photovoltaic systems

Solardynamik GmbH actively researches and develops innovative ideas and concepts in order to make solar technology and renewable energies more efficient for both public authorities and for the market. Currently, Solardynamik's main focus is the development of adapted solar technology and the production of fixed and dynamic panel systems to create added value for agriculture, mobility and advertising. Overcoming obstacles is at the core of Solardynamik's business such as, for example, achieving a better integration of solar technology within the architecture and landscape in both urban and rural structures. Solardynamik offers services such as consulting, mediation, marketing and project planning.

THE NEED. Current tracking systems for photovoltaic systems are ineffective and cost-intensive. An installation on lightweight roofs is not possible due to their weight and the same problem exists for elevation systems. These traditional systems do not allow for additional use as circulation areas. Moreover, these systems do not create additional benefits.

THE SOLUTION. Our tracking systems and elevation systems for photovoltaics as a lightweight construction concept are based on polymers or films. The systems are installed at low pressure and the tracking technology is operated at low pressure. This technique brings further benefits, as it adds another sealing to the roof. Other additional benefits in a current R&D project are being developed together with Fraunhofer IAP in order to integrate films with additional functions such as thermotrope films.

VALUE PROPOSITION. We achieve high material and system efficiency thanks to the low air pressure range with which we install and track the carrier system. Through this technology system, a high cost reduction potential is achieved in the entire value chain.

B59 · **Solelia Greentech** · *Sweden*

Connected electric vehicle charging infrastructure

Solelia Greentech AB proposes a system that links solar energy production through a virtual network of photovoltaic (PV) solar cells to charging stations for EVs. The system is called the Solar Bank System and it minimises the dependence of EV charging on conventional fossil fuel based energy sources. It connects solar producers directly with consumers for solar use on the spot.

THE NEED.

While the installation of solar cells, photovoltaic (PVs), is increasing, most private individuals, real estate companies, cities and organisations installing PVs, struggle with long payback times. On the other hand, full deployment of electric vehicles, requires the connection of renewables to a distributed network in order to minimise the dependence of EV on non-renewables energy sources.

THE SOLUTION.

Every kWh produced in solar installation connected to the Solar Bank is deposited into the owner's account. Surplus of electricity can be sold to the Solarbank, who can then create solar parking for electric cars in regular charging poles in the city. The charging stations communicate regularly with the Solar Bank via the mobile network or an existing internet connection, giving the Solar Bank real-time information of when and where solar power is produced and used.

VALUE PROPOSITION.

The Solar Bank system allows to charge electric vehicles through charging with solar electricity from specific and nearby solar plants, adjust power use to the amount of available solar electricity in a virtual network and adjust the cost of vehicle charging based on how environmentally friendly it is, for example, by lowering the cost for customers who accept longer charging time by using only locally produced solar electricity. In addition, The Solar Bank system results in a new income for renewable energy producers that reduces the payback time of the investments
in renewable energy.

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- Municipality / District

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MARKET SEGMENTS

- Solar PV
- Off grid

CUSTOMER REFERENCES

ABB, REE, TERNA, Schneider Electric, Bosch, Solairedirect, ...

B60 · **Steadysun** · *France*

Solar production forecast from a few minutes to several days in advance

Steadysun makes management of power grids and photovoltaic power plants easier, enabling its customers to reduce their operating costs by using its solar forecasting systems. Combined with meteorological models, satellite imaging and instrumentation on site, SteadySun technology generates forecasts ranging from a few minutes to a few days. Operators of photovoltaic power plants and power grid managers can therefore better predict the power generated and reduce financial or technical risks related to variable weather conditions.

THE SOLUTION.

SteadySun offers solar forecasting solutions to anticipate solar resources. The SteadySun method combines physical modelling and mathematics: artificial intelligence, expert system, fuzzy logic, image processing. Production forecasts are made by linking analysis of photovoltaic power plant data to meteorological indicators: insolation, wind, pressure, humidity, cloud cover, temperature; satellite imaging; on-site video images. The SteadySat and SteadyEye intraday packages are based on image processing and form recognition. After retrieval of the information, learning models (artificial intelligence), linked to power plant modelling, are put in place. They are used to produce statistical analyses, then production forecasts.

VALUE PROPOSITION.

Steadysun offers single and combined services to predict solar production taking into account specific national regulations and energy mix. Our service modules cover three different time horizons from few minutes to several days.

B61 · **Swedish Algae Factory** · *Sweden*

Algae-inspired efficiency enhancement for solar cells

An innovative material that boosts the efficiency of solar cells is based on the nanoporous silica shell that surrounds a specific strain of diatom, an algae species that grows well in the bottom of dark and cold Nordic seas. The material is naturally designed to trap light efficiently in order for algae to be able to survive on sunlight in this dark environment.

THE NEED.

Solar panels are known to be inefficient. They only transform 15-20 % of the light that hits them into electricity. Since the main cost of solar energy today is no longer related to the cost of the solar cell but rather its installation cost, one of the most reasonable ways to cut the cost of solar energy is by finding a way to enhance the efficiency of the solar cell.

THE SOLUTION.

The nanoporous silica shell that surrounds a specific strain of diatom, an algae species that thrive in the bottom of dark, cold Nordic seas, is a material naturally designed to trap light so efficiently that algae can survive on harnessed sunlight in this dark environment. When incorporated into solar cells, the light trapping ability of the solar cell is increased and its efficiency enhanced. The material is produced in a process where wastewater is treated and an organic biomass produced that is able to utilised in a variety of applications beneficial for society.

VALUE PROPOSITION.

- Increased efficiency of solar cells.
- Lower cost of solar energy.
- Environmentally-friendly produced natural nanomaterial.

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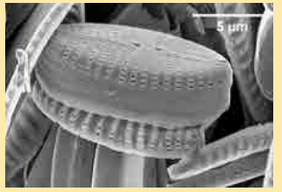

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Board of Directors

Johan Sköld
Board of Directors

MARKET SEGMENTS

- STE

B62 · **Turbulent** · *Belgium*

Next generation hydroelectric powerplants based on biomimicry

Turbulent is developing a new and efficient hydropower technique to deliver affordable renewable energy. These hydropower plants range from 5kW to 200kW and are being built using standard components combined with our specifically modelled propeller.

THE NEED.

Around 1.3 billion people have no access to electricity and many more rely on diesel generators or other polluting sources of energy. Renewables such as wind or solar are too volatile and can be unstable sources, while large hydro projects cause significant environmental damage.

THE SOLUTION.

Turbulent has developed a smart, small-scale and decentralised hydropower plant. In contrast to traditional plants, an easy-to-install turnkey product has been created to deliver affordable, reliable and clean electricity to even the most remote parts of the world.

VALUE PROPOSITION.

Turbulent's competitive advantage lies in the use of natural flow principles to convert the river's available energy into electricity. Furthermore, and contrary to most other hydropower techniques, the Turbulent hydropower plant is designed to work efficiently on sites with a low height difference and can be installed without large construction works. Efficient and easy to install, Turbulent's hydropower plant design provides one of the most affordable sources of energy available.

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Geert Slachmuylders
Innovation Manager

Young entrepreneur with a degree in Industrial Engineering from the GroepT university college, specialising in renewable energy products.

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Young entrepreneur with a degree and background in management, finance and taxation.

Luc Berber
Technical Manager

Experienced IT expert with background in operations and technological development.

MARKET SEGMENTS

- Hydro

B63 · **Uni-Heat** · *Poland*

100 kWh CTES cold thermal energy storage

An innovative energy saving system that works in conjunction with commercial direct-expansion (DX) air-conditioning systems in commercial buildings, storing energy at night and delivering it when needed, during the peak hours of the day.

THE NEED.

In recent years, the demand for cooling energy in Europe has shot up, a trend that has been driven by an increased desire for comfort, changing climate conditions and architectural trends, such as an increased fraction of glazed areas in buildings. By 2020, the general demand for the cooling energy in Europe is expected to increase to 500 TWhc (200 TWhc in 2000 year). The European Commission expects cooling demand in EU buildings to rise 70% by 2030. The existing cooling technologies not only consume large amounts of energy but also are highly polluting; it is estimated that refrigeration and air conditioning cause 10% of global CO2 emissions.

THE SOLUTION.

Uni-Heat offers 100 kWh CTES cold thermal energy storage, which works in conjunction with commercial direct-expansion (DX) air-conditioning systems in commercial buildings. The system stores energy at night (when electricity is less expensive) and delivers that energy during the peak hours of the day to provide cooling to the building. The system is intended to work as a battery for the air conditioning system, supporting the system with the stored energy during the day. Thats why 100kWh CTES can work as a demand response support system, key part of a ESCO or energy performance contracts for commercial and residential buildings.

VALUE PROPOSITION.

- Demand response support system.
- A key part of ESCO contracts.
- A key part of energy performance contracts.

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THE TEAM

Pawel Matusiak
Board Member

MARKET SEGMENTS

- Heating & Cooling

CUSTOMER REFERENCES

Omega SP Zoo

B64 · **VIB studio** · *Poland*

Commercialised by EC Systems AMC

Increasing the productivity and profitability of wind generation

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THE NEED.

Achieving high levels of turbine availability while optimising maintenance costs is fundamental to a profitable wind-energy business. Condition-monitoring systems (CMS) can protect wind turbines from unexpected shutdowns, diagnose problems, and reduce planned and unplanned downtime, but often struggle with data quality in extreme and variable operating conditions. The result is slow, inaccurate results that lead to wasteful false alarms and delayed responses. VIBstudio Wind from EC Systems uses vibration-based analysis to overcome these problems to improve the overall performance and profitability of each installed turbine.

THE SOLUTION.

VIBstudio Wind from EC Systems is an intelligent platform for wind turbine condition monitoring and diagnostics. Deploying high-quality data acquisition and automatic, real-time data validation techniques, it analyses vibration signals to provide precise, independent information about the condition of a wind turbine's electrical and mechanical components. VIBstudio Wind consists of three components: a monitoring unit embedded in a wind turbine's nacelle; an intuitive browser through which maintenance engineers can monitor events; and a central database for large installations. With its robust, flexible hardware and modular architecture VIBstudio Wind can be used to increase availability and productivity of individual turbines and entire wind farms, both on- and off-shore.

VALUE PROPOSITION.

The VIBstudio Wind platform enables wind farm operators to identify the early symptoms of malfunction or damage in a wind turbine, and to compare information on the current state of the machine to the historical data to make prognoses for the future. It helps reduce downtime, increase safety, eliminate unnecessary preventative component replacement, and extend the lifetime of valuable assets. The result is improved productivity and profitability. Analysis shows that VIBstudio Wind reduces failures and downtime by up to 70 per cent, decreases maintenance costs by up to 20 per cent, and increases the lifetime of monitored machines by up to 30 per cent.

MARKET SEGMENTS

- Onshore wind
- Offshore wind

CUSTOMER REFERENCES

Gas Natural, Cobra, Enhol, Banc Sabadell, Eolos

B65 · **VIS Energia** · *Poland*

An IT system providing reliable and highly accurate information in the wind farm exploitation field

With eWIND a wind farm owner can: Prepare an accurate forecast of energy production, observe the actual state of the wind farm, predict turbine parts damage, collect data about how efficiently a wind farm service is working, prepare reports on the state of the wind farm.

THE NEED. The major challenges to wind farm owners are: Losses due to differences between prognosis and real energy production. Lack of management information regarding service works - over 1500 service documents monthly on middle-sized wind farm - no managerial information. Possibility of controlling servicing teams: Control of service cost, control of stoppage time, control of the sla contract, service tickets for service groups. Stoppages resulting from the delays of spare parts delivery. Minimising delivery time is important for business.

THE SOLUTION. VISEnergia's eWIND provides: A high level of forecasting energy production - using neural network with connection of the service information. Managing of Service - Software for collecting data of time and work costs of wind farm service – including downtime losses. Lack of managerial information - information is key, not data. The solution for this is software that prepares precise reports (a BI style solution). Delays to replacement parts delivery. The solution is predictive software that can project service incident and inform on wind farm management earlier - before breakage occurs.

VALUE PROPOSITION.

Making the most of weather conditions:

- High accuracy of production forecast.

Reducing wind farm exploitation costs:

- Effective service management including planning inspections of facilities.
- Algorithms predicting damages and reducing the number of technical visits required.

Optimal work of farm infrastructure:

- Online feedback from monitoring systems.

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THE TEAM

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15 Years in IT Business as CEO and project management.

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30 Years in energy business and software development.

Tomasz Forc
CO Founder
17 Years in energy market and IT project management.

MARKET SEGMENTS

- Onshore wind

B141 · **BeOn** · *Portugal*

The BeON Microinverter enables a PV system to become DIY and change the way we think about the solar business

The BeON microinverter is a device that allows any PV panel to be connected directly to an ordinary wall socket, safely and easily. This means solar systems can be sold anywhere and as cheaply as DIY kits, lowering €/W costs significantly and engaging people directly in renewable technologies. The BeON microinverter is a technology marvel: the most reliable piece of electronics commercially available, it has a 25-year warranty and a zero failure rate in 10.000 units sold.

THE NEED. With the end to feed-in tariffs, the race is on to come up with new solutions to keep PV alive. In addition to the need for low-cost PV panels, there is also a requirement to lower the costs of the distributed installed systems and the energy produced as a means of compensating for ever-increasing electricity prices.

THE SOLUTION. The BeON microinverter has already proven itself a successful solution, rehabilitating the solar business in Portugal in 2015 with a self-consumption DIY model that allows people to assemble their own PV systems and use all the energy they produce. Drastically lowering the cost of locally produced energy to less than half of what the electric grid operator offers, this solution has brought hundreds of solar companies in Portugal back to business, as well as opening up new business opportunities for forward-thinking large grid operators, providing them with an opportunity to join the self-consumption business.

VALUE PROPOSITION. BeON is the only microinverter company focused on a DIY solution. BeON microinverters have the longest guarantee in the world, lowering the cost of the energy produced for a 25-year warranty period. Furthermore, in implementing advanced failure-proof systems and materials, a proud record of zero unit failures in 10.000 units sold has been achieved.

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THE TEAM

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José Marçal
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PhD studies in control systems, master in electric engineering Working for 5 years in R&D team management.

Renato Braz
Business Creation Manager

B142 · **Solaris Offgrid** · *Spain*

The pay as you go solar home solution that scales with the needs of the off-grid consumer

Solaris is a modular solar home system with integrated pay-as-you-go technology. It allows the consumer to purchase a 20W system and upgrade it over time up to 200W as their energy needs grow, without replacing the main control unit or replacing the original installation. Solaris is offered with a range of energy efficient appliances, from lighting to clothing irons. The system is paid weekly via mobile money over a period of up to 3 years.

THE NEED. More than 600 million people in Sub-Saharan Africa struggle to access modern energy services and must rely on unhealthy and dangerous energy solutions such as kerosene lighting. Solar home systems provide an extremely promising technology for providing clean energy access, drastically improving livelihoods, education, and standards of living.

THE SOLUTION. The Solaris pay-as-you-go (PAYG) business model, combined with the innovations made in customer service, hardware, software, and deployment efficiency, enable the company to rapidly build momentum and scale. Solaris hardware is fully modular, when a customer installs an entry level 20W system, for example, they will be able to keep the base system and wiring intact while they add additional panels (up to 200W), batteries, and consumer electronics (TV, fridge, etc.). This modularity allows for a strong relationship to be maintained with clients and makes upgrades much more affordable for them.

VALUE PROPOSITION. The company owns all technology and the Solaris control unit is purpose built using off-the-shelf components, which keeps production costs very low. Most PAYG solutions use GSM technology to reach consumers, but research shows that most rural homes lack a reliable mobile signal making these PAYG solutions irrelevant to the majority of the market. Innovative SMS encryption technology allows the company to collect valuable service data for predictive maintenance, while also reaching households that other technologies can't reach with a service that requires no data connection fees.

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THE TEAM

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Worked for 4 years in the energy consulting industry after graduating with a BSc in International Business and an MS in Sustainability & Strategy (NEOMA & SKEMA Business Schools).

Benjamin David
CTO

Graduated with an MSc. Environmental Engineering and an MSc. International Affairs (Sciences Po, Paris).

B143 · **Sunaitec** · *Portugal*

A new design for solar thermal panels that offers full architectonic integration, temperature control and more energy production / sqm

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MSc Marketing . B.Sc. Business and Management. Junior executive with experience in general management, brand management, marketing strategy.

CUSTOMER REFERENCES

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The Sunaitec's solution has a revolutionary design concept comprised of a variable number of lightweight thermal CSP receivers and support columns that house smart electronic controls. The equipment can be installed in a way that provides shading to building facades, windows, outside seating, parking areas, rooftops, etc. The receivers have a CSP technology with a mechanism that tracks the sun ideally to maximise energy production up to 30% / sqm. The system has full temperature control capability through the misalignment of the receivers. The equipment and installation can be monitored online.

THE NEED. Conventional solar energy equipment problems: Difficult architectural integration. Technology from the 1970's. Fixed positions with restricted areas available. Large dimensions and heavyweight collectors. Absence of a temperature control mechanism. Reduced performance in wintertime. Reduced longevity. High maintenance costs. Lack of versatility: only energy production.

THE SOLUTION. Full architectonic integration. More energy production / sqm. A fully automated temperature control.Installation anywhere and at any angle. Internet monitoring.Cutting-edge technology. Active solar tracking system with guide sensors. Lightweight and dimensions. High efficiency even during the winter (tracking).

VALUE PROPOSITION. Full architectonic integration. More energy production / sqm. A fully automated temperature control. Installation anywhere and at any angle. Internet monitoring. High efficiency even during the wintertime. Lower maintenance costs. High versatility: energy, shading, roofing and protection barrier.

Clean coal and gas technologies

B66 · **Act&Sorb** · *Belgium*

Produce high value materials and electrical and thermal energy from specific organic waste streams in line with the principles of the circular economy

Act&Sorb has developed an innovative self-sustaining recycling strategy for several barely recyclable waste streams, to produce high value raw materials and energy (heat and/or electricity). The produced raw materials find applications in a broad range of industries, such as waste treatment, chemical processing, food and beverage processing. The business model is based on the development of complete tailor made projects.

THE NEED. One of the major steps in the transition to a circular bio-economy is the development of recovery and recycling strategies of waste streams into resources and energy. However, large amounts of today's waste streams end up on landfills or are burned. Sustainable solutions are required.

THE SOLUTION. Act&Sorb has developed a turnkey self-sustaining recycling strategy for different non-recyclable waste and rest streams, with the production of high value resources of materials and surplus energy in the form of heat and/or electricity (project specific).

VALUE PROPOSITION. Act&Sorb focuses on the valorisation of non-recyclable waste streams and converts them into high value marketable raw materials and end products with the production of surplus energy.

- Production of high value raw materials.
- Clean technology to shift waste towards resources with the production of energy.
- High-end R&D evaluation of the end products.
- Constant R&D evaluation of new input materials for recycling technology.
- Highly scalable and adaptable

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THE TEAM

Kenny Vanreppelen
Doctorate in Science

Chemistry Masters in Industrial Engineering in Nuclear Technology, during his professional career (7 years) he worked on multidisciplinary PhD-research in close collaboration with industry to up-cycle industrial waste streams into new products.

Uwe Prade
Chemical Engineer

Masters in Business Administration, developed his career over 30 years in innovative product and process development in different positions, from chemical engineer to head of production, logistics, sales, purchase and R&D.

MARKET SEGMENTS

- Industry
- Biogenic & Synthetic gaseous fuels

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MARKET SEGMENTS

- Heating & Cooling
- Biogenic & Synthetic solid fuels

B67 · **Bio-Eco-Matic** · *Poland*

Commercialised by MetalERG

Transforming low-cost straw into high-value heating

Highly automated straw-fired biomass boilers help enhance farm income and rural economies.

THE NEED.
For farmers, rural businesses and local communities looking for cost-effective heating systems, straw-fired biomass boilers offer significant advantages. Straw is thermally efficient, and the cheapest than all fossil fuels and other forms of biomass. It is readily available as a by-product of agriculture and requires minimal processing to be used as a fuel.

THE SOLUTION.
The Bio-Eco-Matic boiler from MetalERG is a fully automatic straw-powered batch boiler with an energy range of 200kW to 995kW. The boiler delivers significant cost savings by using a readily available, independent and low-cost fuel. Its automatic loading system means it can use whole straw bales for combustion without additional manual intervention. It can also be fitted with an automatic ash-removal system and heat-exchanger cleaning system to minimise maintenance requirements. It has a modular design that makes it suitable for heating a wide variety of agricultural, commercial and residential buildings. The final configuration of the boiler is tailor-made for each customer, taking into account energy requirements, the type of straw, and space availability.

VALUE PROPOSITION.
The Bio-Eco-Matic boiler offers a local and completely independent source of low-cost and carbon-efficient heating for all users. For farmers and landowners, it creates an additional market for straw that would otherwise have been incinerated as waste. The boiler has eliminated heating costs for many agricultural users, and increased local trade – with a consequent increase in local employment and income.

B68 · **Boneffice** · *Poland*

A performance monitoring and power unit optimisation system

The product is a real time operations decision support system for power plants that is based on a deterministic model of power unit thermodynamics. The methodology is protected by a patent in the European Union. Gathered data creates referential parameters for a power unit in given conditions (load, fuel, temperatures, etc.). The system calculates in real time heat rate deviation for critical elements of the power unit and visualises the suboptimal performance of the unit. A continuous efficiency improvement plan is also offered to set up procedures and practices to control and execute the highest possible performance during operation.

THE NEED. Fossil fuel-powered power units are currently delivering electricity in very unstable grid conditions. CO2 emissions constraints and other environmental challenges require high efficiency operation. Operators should have the tools to retain high performance parameters in real time.

THE SOLUTION. Software determines in real time the heat rate deviation in the components of the power unit to be used. This determines reference parameters for given conditions. A graph of losses and efficiency levels is built that provides an excellent means of controlling performance. The BonEffice System identifies necessary actions to be taken in order to improve the unit's performance, and quantifies the improvements possible owing to appropriate changes in the service, metering, fuel and other systemic modifications. This cross validation of data (CEMS, DCS) imposes strict requirements in terms of the quality of data from various sources. The method of graphic reporting enables real-time monitoring of the changes in generation parameters following operational changes.

VALUE PROPOSITION. Audits of real data from 13 power units have shown significant potential savings resultant from this system's implementation; the total benefit of coal consumption reduction and additional reduction of costs incurred for coal and carbon allowance is estimated to be around 3,5%. A continuous efficiency improvement plan allowing for maximisation of savings.

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Jarosław Roszkowski
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Program Manager with managerial experience particularly in start-up investments and business development.

Leshek Gladek
PhD- CTO

For 20 years he has been effectively engaged in commercial projects of new technologies, both conceptually and executively. He has also published several dozen works and has obtained a few patents.

MARKET SEGMENTS

- Fossile solid fuels: Coal

CUSTOMER REFERENCES

Jaworzno III power plant

B69 · **HYGEN** · *Latvia*

An innovative low-cost and convenient compressed natural gas home refuelling station

HYGEN has developed an innovative home refuelling station for Natural Gas Vehicles (NGV) and Extended Range Electric Vehicles (EREV). HYGEN's technology enables a disruptive, dramatic decrease in refuelling infrastructure costs (by 8 times), matching the price point of less than 0,20 EUR/liter equivalent (EU) or 0,75$/ gasoline galon equivalent (USA). The concept of home-based refuelling takes advantage of the natural gas distribution grid to develop the largest alternative vehicle refuelling infrastructure on earth. By offering a cost-effective and convenient solution to the chicken and egg problem hindering the advancement of refuelling infrastructure, HYGEN becomes an enabler for NGVs and EREVs to flourish, and become major competitors to conventional fuel cars.

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Robert Strods
Project Manager

Investment banking background and commercial experience. Raised > 30M EUR of funding. Member of CEN/TC 326.

Alex Safronov
Inventor of MLP Technology

International expert and consultant. Convenor of WG CEN / TC 326 / WG6. Committee member of ISO / PC 252 / WG1.

Mario Pirraglia
ex VP of HYGEN's rival

FuelMaker corp. serves on the advisory board of the company.

MARKET SEGMENTS

- Gas & Steam turbines

THE NEED. The transportation industry has no real alternative to oil-based fuel in the private sector. Although natural gas offers a cleaner and cheaper option, the lack of convenient infrastructure means that it still is far from being the end-user's preferred choice.

THE SOLUTION.

(HYdraulic GENerator) revolutionised gas compression with its patented multifunction liquid piston (MLP) technology; instead of mechanical compression, MLP technology is used with 95% of its parts mass produced and used for decades. This gives the home refuelling station (HRS) the unique values of a disruptive price point, reliability, and an under-10 min refuelling time.

VALUE PROPOSITION.

- Under 0,25 EUR gasoline liter equivalent total cost of ownership.
- Increase gas conumumption and regulated asset base for gas companies.
- Decrease fuel costs and increased convenience for the driver.

B70 · **CO2SNG** · *Poland*

Converts carbon dioxide from industrial facilities into methane that may be easily transported

This innovative product converts carbon dioxide from industrial facilities (e.g. coal-fired power units, chemical, metallurgical or cement plants, biogas plants) into methane, in the reaction with hydrogen from water electrolysis powered by excess and cheap renewable electricity from the grid. The proposed technology is a solution for the storage of surplus electricity from renewable energy sources and a prospective solution for CO2 utilisation.

THE NEED. The CO2-SNG system aims to utilise CO2 separated from industrial facilities (e.g. coal-fired power plant) and, simultaneously, convert the surplus electricity from renewable energy sources into methane. It allows energy producers to reduce CO2 emissions and to adjust the electricity production to its demand.

THE SOLUTION. The product proposes a different and a complementary approach to CO2 utilisation, which does not require high compression and transport like the CO2 sequestration. The produced methane may be easily transported and used in many installations around Western and Central Europe and enables the independence of natural gas import. The product will be offered to electricity producers, biogass producers and ammonia producers.

VALUE PROPOSITION.

- Utilisation of CO2.
- Surplus electricity utilization.
- SNG production.
- Attractive return on investment.
- Independence of natural gas supplies.

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Marcin Liszka
PhD, CEO of EXERGON company

MARKET SEGMENTS

- Biogenic & Synthetic gaseous fuels
- Gas DSO
- Energy storage solutions for the grid

B71 · **DAK GPS** · *Poland*

Green power solutions

THE NEED.
The world is based on the consumption of goods stored by nature and created by humans. As the world's population increases, consumption expands and more waste and more by-products are generated. The excessive emission of greenhouse gases - mainly CO_2 - has reached critical levels, with climate change a reality. Yet the development of technologies mitigating these negative effects continuously falls behind the rapid rate of consumption.

THE SOLUTION.
Biomass uses energy derived from chemical bonds formed during the absorption of CO_2 from the air and from photosynthesis. This process is conventionally adopted with no emission due to the closed circuit of CO_2. DAK GPS has developed a product that is a combination of both solutions and a new biofuel, providing a new solution for all.

VALUE PROPOSITION.

- Fuel safe for low power boilers, and household heating purposes.
- Compact, easy to use and store.
- High calorific value.
- Closed cycle of matter in nature.

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Biomass market expert

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Technical director

MARKET SEGMENTS

- Fossile solid fuels: Coal

B72 · **InTherSoft** · *Poland*

A low delay temperature measurements system for high frequency thermodynamic processes

Innovative thermometer (temperature measuring sensor - thermocouple - built in the form of a cylinder cover) plus software with a special algorithm for necessary calculations. Excessive temperatures and rapid temperature changes cause a higher strain on the equipment and shorten its lifespan. This product is suited to harsh environments, however, and is particularly adept at taking measurements at high pressures and temperatures, and of high temperature gases flowing at high and low pressures.

THE NEED. A typical thermometer shows the temperature about 50 seconds after taking a measurement, resulting in a delayed temperature. When a temporary excess in the permitted temperature is not identified, it has a negative effect on the durability of the tubes and headers of superheaters, weakening the system. Furthermore, the very high temperature of steam can cause unexpected failures and can be the reason for increased steam oxidation of superheater tubes. In effect, the local overheating of tubes may shorten their lifetime due to their degradation.

THE SOLUTION. InTherSoft's measurement system solves these problems. The proposed product allows power, petroleum and chemical plant operators to reduce the chance of failure caused by overheated metal - by 10-15%. Connection of the thermocouple sensor with a special algorithm contributes to improving the accuracy of the temperature control of superheated steam - by up to 70%.

VALUE PROPOSITION. Elimination of metal overheating in boilers, pipelines, turbine components, and other pressure installations. Optimisation of the heating and cooling processes of the thick wall pressure elements can be monitored. Faster and safer start ups, shut downs, and load changes of the power plant units. Lifetime extension of the pressure elements in industrial installations. Superheated steam temperature control can be significantly improved.

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Professor at the Cracow University of Technology. His main fields of activity are mechanical engineering and thermal power engineering.

Adam Sury
PhD in Technical Science, CEO
Co-author of numerous computer control end expert systems implemented at petrochemical company, power plants, aerospace companies and others.

Marek Wojtas
Deputy CEO of InTherSoft
Designer and contractor in the field of computer systems, automation, control, security and management of production processes in various industries including the mining industry and the aviation industry.

MARKET SEGMENTS

- Fossile solid fuels: Coal
- Heating & Cooling
- Industry
- Gas & Steam turbines

B73 · **Xsensor** · *Poland*

Commercialised by EC Systems AMC

Wireless sensors with a contactless battery and an open communication protocol to enhance maintainance and boost the environmental

EC Systems AMC proposes to develop a line of wireless sensors which will provide key information to improve the management and operation of power generation assets. The products will cover the most important sensors used for condition monitoring and structural health monitoring with vibration, magnetic sensor and a universal unit able to be used to connect any standard probe and make it a wireless node. Each Xsensor product will be equipped with a wireless communication interface as a feature, providing a data transmission service.

THE NEED. There is a need to provide an easy way to obtain critical data on the technical state of mechanical and structural equipment and transform it into significant information. In order to achieve this, the company has developed a system which would provide significant support in general plant production maintenance.

THE SOLUTION. EC Systems AMC propose a system of machine element monitoring that is suitable for power plants and coal mines. Its main benefit is increased information about the technical condition of remote or inaccessible assets. The wireless communication interface satisfies the need for a reliable and secure way to transfer information across sensors and the IT infrastructure.

VALUE PROPOSITION. A reliable wireless communication interface which reduces the installation cost of sensors. The integration of functionalities of many devices into one universal sensor through connection of external sensors. Automatic validation of acquired data which filters out almost all corrupted or insignificant data, typically the cause of false alarms. Ability to inspect pipes that were previously considered costly to inspect, thereby increasing operational safety and availability. A contactless battery provides a simple and safe way to power the sensors.

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THE TEAM

Tomasz Barszcz
(M)
25 years of experience in industry and academia. He has worked as designer, R&D department manager and as CEO of EC System AMC. Several condition monitoring systems were developed under his guidance.

Tomasz Mikołajczyk
(Ma.E) (M)
Proven experience in defining company strategy, processes and organising daily operational activities.

Tomasz Potaczała
Ma.E (M)
Head of department in embedded systems. He has over 15 years experience in designing systems, data collection and analysis. He worked as a manager, then from 2011 as technical director. He currently works as the head of embedded systems at EC Systems AMC.

MARKET SEGMENTS

- Coal market

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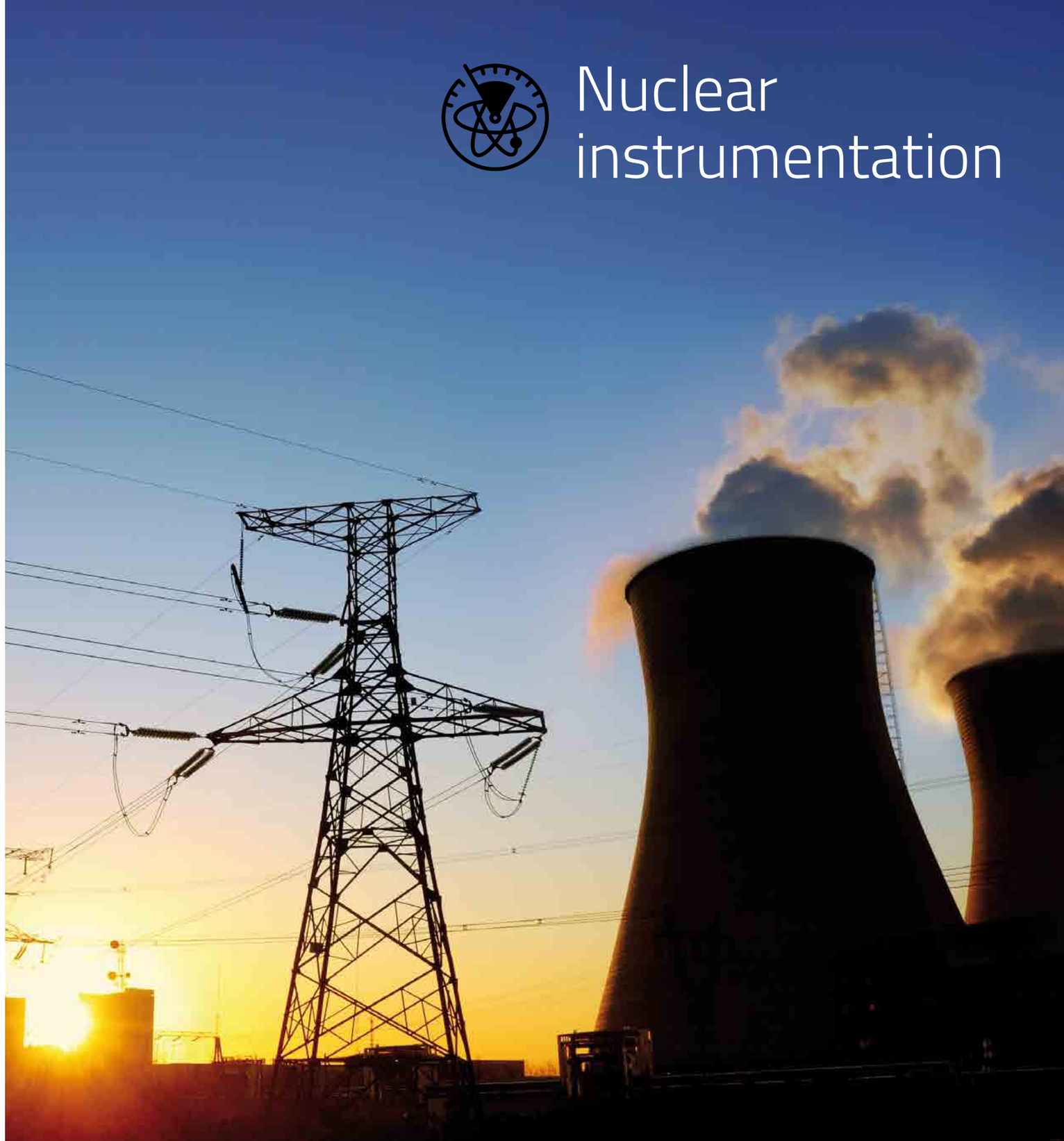
112	**LeadCold**	74



Nuclear instrumentation

B74 · **LeadCold** · *Sweden*

Small nuclear reactor for reliable, sustainable and less costly power on off-grid sites

LeadCold has designed a small nuclear reactor – SEALER (Swedish Advanced Lead Reactor) – that addresses the need for reliable, sustainable and less costly power on off-grid sites.

THE NEED.

Power production in off-grid communities and mining sites often relies on diesel generators, which results in high costs plus detrimental effects on health and environment. The best solution is an affordable, reliable and sustainable off-grid alternative to diesel generators. Small nuclear power plants can meet this need.

THE SOLUTION.

In collaboration with the Swedish steel industry, the founders of LeadCold have developed an aluminium-alloyed steel (Fe-10Cr-4Al-Zr) that is highly corrosion resistant during long-term exposure to molten lead. Based on this technological breakthrough, the company has designed a small reactor named SEALER (Swedish Advanced Lead Reactor).

VALUE PROPOSITION.

SEALER uses conventional uranium oxide fuel to produce 3-10 MW of electric power without fuel reload. The lower level is adequate for supplying power to arctic communities and corresponds to a reactor life of 30 years. The higher level is suitable for mining applications and has a core-life of ten years. Importantly, the residual waste produced by both types requires less than 1000 years of storage, in strong contrast to the more than 100,000 years' storage needed for the high-level waste produced by today's nuclear reactors. Furthermore, no accident scenario can lead to a situation where evacuation becomes necessary.

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CEO and founder of LeadCold

Janne is Professor of Reactor Physics at the Royal Institute of Technology.

Peter Szakálos
Chairman of the Board and co-founder

Peter obtained his PhD degree in Corrosion Science at KTH.

Jesper Ejenstam
Materials expert and co-founder

PhD on corrosion studies of aluminium bearing alloys at KTH.

MARKET SEGMENTS

- Off grid
- Nuclear energy

"It is important that the community with different players from the ecosystem, whether they are entrepreneurs, venture capital firms or corporates comes together and learn how we can do business together"

Gina Domanig, *Managing partner,* Emerald Ventures

Smart electric grid

B75 · **ColdShift** · *Netherlands*

Intelligence and flexibility in managing the electricity consumption of supermarket refrigeration systems

ColdShift has developed a controller for supermarket refrigeration systems that enables electricity use to be postponed or accelerated in accordance with the price of electricity. The company produces hardware controllers as well as web-based solutions, marketing them, in cooperation with European partners, to supermarkets and food retailers Europe-wide.

THE NEED.

Supermarkets and food retailers can reduce costs and generate additional income by taking control of their own consumption of electricity. In order to influence 'time of use' of the refrigeration system, a controller is required that will ensure temperature requirements are always respected.

THE SOLUTION.

The ColdShift controller shifts the time of use of the refrigeration system to advantageous periods, when the cost of electricity is low. The controller can also reduce refrigeration needs on demand. The embedded intelligence ensures that temperature requirements are respected throughout these operations.

VALUE PROPOSITION.

The ColdShift controller is the only available time of use controller for supermarket refrigeration systems that rigidly respects food temperature levels. It offers the possibility to profit from variable, spot market-related electricity pricing. The ColdShift controller also allows retailers to benefit from third party electricity demand reduction programmes.

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THE TEAM

Sietze van der Sluis
Owner
20 years of extensive experience in supermarket refrigeration research and development in national, European and international R&D projects.

MARKET SEGMENTS

- Industry
- Tertiary (non-residential) building
- Heating & Cooling

CUSTOMER REFERENCES

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Filip Jankun
MSc in Mechatronics from the Warsaw University of Technology. Product Manager for the Public Transport Application at IMPACT, he has been involved in bus projects for over four years.

Katarzyna Kozlowska
Junior Project Coordinator, IMPACT

MARKET SEGMENTS

- Smart energy efficient mobility

B76 · **EBUS BATTERY** · *Poland*

Commercialised by Impact Clean Power Technology

Modular battery system for electric buses

The product is a modular system of battery packs that will allow the use of new types of cells of different chemistry and performance parameters, depending on each specific urban scenario, and which will be standardised in order to facilitate integration with the bus. The implementation of new algorithms enables the precise determination of the residual life and economic value of the batteries.

THE NEED. Battery systems for electric buses are currently too expensive to compete with diesel engines. Also, they do not respond to the wide range of requirements of bus operators. Customers are looking for a long-term and broad cooperation with their suppliers. For economic reasons, they prefer to work with one rather than several different suppliers yet these are normally linked to only one type of cell. The product to be developed will allow the manufacturer to work with one battery supplier yet offer a tailor-made product in a standardised box.

THE SOLUTION. The objective of the E-bus battery project is the development of a modular battery system capable of using new types of cells of different chemistry for applications in the public transport sector and for re-use in stationary applications. The modular battery system will consist of several battery modules with a capacity of 30 to 60 kWh. Basic battery blocks will be developed in three versions and based on cells with three different chemical compositions: NCM/HC (long life), NCM/Ni (low price) and LTO (high power, possibility of frequent and quick recharging), but in the same casing and with the same BMS (battery management system). Battery blocks will be interchangeable, this allows the optimal solution to be obtained according to requirements set by a given operator.

VALUE PROPOSITION.

- Provide flexibility to tailor the battery system to individual requirements.
- Decrease the cost by offering a standardised product.

B77 · **Eldev** · *Germany*

Smart, efficient, connected battery management solutions

Eldev develops and manufactures battery management solutions aimed at increasing efficiency and enhancing connectivity. This next generation technology targets a wide spectrum of specialised applications in the Lithium battery market such as battery systems for yachts, caravans and commercial use vehicles.

THE NEED.
Lithium batteries are replacing lead-based batteries in an increasing number of applications. This is due to their enhanced performance with regards to energy density, temperature stability and so forth. However, the cost of Li-based batteries is still high due to their complexity and the price of the raw materials. This hinders swift adoption of this superior technology in many target markets.

THE SOLUTION.
Eldev has developed an advanced battery management system (BMS) with a uniquely simple yet powerful design. The resulting value-cost ratio enables the introduction of Li battery technology in new cost-sensitive markets, while it stands up to the highest technical standards. BMS acts as an all-in-one orchestrator for battery cells, secures maximum efficiency and safety in operation, and provides wireless interfaces for remote maintenance. High efficiency, smart connectivity and easy usability result in a higher performance in accordance with customers' needs.

VALUE PROPOSITION.
Eldev focuses on battery management solutions for special applications, such as caravans, yachts or special purpose vehicles. Years of experience with technological requirements and the economical considerations of our customers inspired us to innovate Li-batteries, making them more affordable. The significantly-reduced complexity of the battery management system has resulted in products that are outstanding not only in efficiency, connectivity and usability, but also economically. IoT connectivity allows for large and small-scale battery fleet management and predictive maintenance resulting in truly smart batteries.

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MARKET SEGMENTS
- Solar PV
- Energy storage solutions for the grid

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MARKET SEGMENTS
- Power DSO
- Power TSO
- Solar PV

CUSTOMER REFERENCES
EDP

B78 · **Eneida** · *Portugal*

Smart sensor solutions for the optimisation of the electric grid

Eneida® develops and delivers especially designed, low cost, low power and robust wireless smart sensor networks, integrated with specific machine learning algorithms and a collaborative software platform. Such networks enable electric utilities to optimise the condition and operation of their critical assets both remotely and online.

THE NEED. Increasing pressure is being placed on the electric grid: the use of renewables, electric vehicles, growing energy demand, regulation and an ageing infrastructure is forcing distribution and transmission network operators to search for new condition monitoring and optimisation solutions, in order to extend asset utilisation, attenuate the need for heavy capital expenditures and to reduce risk, as well as improve energy efficiency, productivity and QoS.

THE SOLUTION. Eneida's highly efficient electric grid optimisation platform, based on an especially designed suite of wireless smart sensor networks, is integrated with specific machine learning algorithms and a collaborative software platform. This helps DNOs and TNOs decide when it is optimal to invest, to maintain and to inspect their assets. As we detect potential problems in the electric network critical assets in real time, with Eneida's solution, network operators can improve their quality of service, reduce their investment needs through improved asset effective life and capacity utilisation, as well as reap energy and operational efficiency gains.

VALUE PROPOSITION. Our unique electric grid optimisation platform integrates especially designed smart sensor networks, inference algorithms and a collaborative software, in order to obtain real time actionable information with a lower total cost of ownership and an explicit learning mechanism for continuously improved recommendations. With Eneida's solution, DNOs and TNOs can increase their quality of service, their critical assets effective life and capacity utilisation, and their efficiency.

B79 · **Ferroamp** · *Sweden*

DC grids for integrating PV, storage and electric vehicles in buildings

Ferroamp has developed the EnergyHub system, comprising products for integrating solar cells, energy storage and electric vehicle-charging in a local DC nanogrid within a building. These innovative products are based on advanced power electronics and result in increased flexibility and safety as well as lower losses. All EnergyHub systems are connected to a cloud portal with live energy data analysis for energy efficiency measures.

THE NEED.

The energy industry is transforming at an unprecedented pace. Solar cells, energy storage and electric vehicles that were exotic technologies a decade ago are now viewed as mainstream in many markets today. This rapid development calls for future proof systems that can easily adapt to fast changing requirements and integrates them in a cost effective way.

THE SOLUTION.

Ferromps EnergyHub system integrates solar cells, energy storage and electric vehicle-charging on a high voltage DC grid within a building. The system is also connected to a cloud-based energy management system.

VALUE PROPOSITION.

The EnergyHub system brings several unique advantages:

- A high voltage DC grid enables a future proof system that can easily be expanded as requirements change.
- ACE technology reduces grid fees and enables faster EV charging.
- One-second resolution energy data enables detailed energy analysis tools.
- Safe and flexible integration of energy storage.

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Åke Rehnman
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MARKET SEGMENTS

- Residential building
- Tertiary (non-residential) building

CUSTOMER REFERENCES

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MARKET SEGMENTS

- Industry
- Power DSO, Power TSO
- Gas DSO

CUSTOMER REFERENCES

Ellevio, ABB, SBAB, Financial Co's, Applied Security GmbH

B80 · **Foreseeti** · *Sweden*

Proactive management of cyber security across complex ICT networks, such as smart grids

A cyber security assessment and modelling tool - a CAD-tool for Enterprise Cyber Security Management - that helps companies understand current cyber security levels across their networks, model future design options, and prioritise investments going forward receive the highest security ROI.

THE NEED.

Cybercrime has become a critical concern. With the increasing complexity and interconnectedness of systems it is vital to manage security proactively and from a holistic perspective. Currently, this is often done through manual expertise, which is risky, costly and inconsistent.

THE SOLUTION.

securiCAD© is a fact based CAD tool for Enterprise Cyber Security Management, that helps companies: objectively understand current cyber security levels across their networks, proactively model design options, and prioritise and ensure that on-going investments receive the highest security levels ROI.

VALUE PROPOSITION.

With its access to expertise, improved security architecture status visualisation, improved cost efficiency in cyber security management and, most importantly, improved cyber security ROI, securiCAD© offers a distinct competitive advantage in user value. While superficially similar solutions are able analyse the present situation, securiCAD© is unique in its forward-thinking analyses. Significant customer interest in the tool proves market need and the tool's value.

B81 · **Forsnetics** · *Sweden*

Delivers magnetic thrust bearings for the hydropower industry

Forsnetics technology enables oil free stations and their increased reliability of operation at an investment that is covered from the savings made due to the reduction of friction losses in these hydropower stations.

THE NEED.
The world hydropower market continues to advance. There are a large number of new installations in the Asian, African and Latin American markets. There are also a large number of refurbishments in North America and Europe. In all such cases, there is a continual need to improve hydropower units and to adapt them to higher environmental standards. Moreover, the increase in wear and tear in stations due to frequent start and stop cycles caused by the integration of other renewables is a concern in the industry.

THE SOLUTION.
Forsnetics has developed an industrial component, a magnetic thrust bearing (MTB), enhancing the efficiency and reliability of hydropower and pumped storage plants.

VALUE PROPOSITION.
The Forsnetics system delivers:

- A reduction of up to 80% in thrust bearing losses.
  This is achieved by adding a component that magnetically reduces the dynamic and base loads on the hydropower stations.
- Increased reliability of operation.
  We prevent thrust bearing failures. We add programmable damping to reduce vibrations and harmful transients associated with start and stop cycles.
- The possibility to change to environmentally friendly lubricants.
  Our system enables water lubricated thrust bearings that help our customers fulfil their environmental goals.
- We enable large hydroelectric facilities.
  When it comes to large facilities the capabilities of conventional thrust bearings is at its limit. With our magnetic thrust bearing, we add load capacity to the system.

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Björn Lindh
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MARKET SEGMENTS

- Hydro

CUSTOMER REFERENCES AND COLLABORATIONS

Vattenfall, Uppsala University, AGH

B82 · **Greenely** · *Sweden*

Residential energy consumption analysed and visualised in a mobile application, without the use of any hardware

Greenely offers a tool that tracks, analyses and visualises residential energy consumption in a mobile application, without using any additional hardware, maximising on the utility of existing Advanced Metering Infrastructure (AMI). By using this tool, offered by a household's energy utility, households receive a rapid overview of energy behaviour and are guided toward more sustainable energy usage. In adopting techniques of gamification and behavioural science, Greenely sustains users' engagement and achieves energy reductions.

THE NEED. Households remain little informed regarding their energy consumption. Current available feedback is too infrequent and too abstract (monthly bills). It is also costly, complicated (hardware solutions), inadequate and dull, failing to engage users' attention (utilities' web platforms).

THE SOLUTION. Greenely offers solutions through energy utilities as an added service to utilities customers. The user is presented with a customised energy tree that blooms when energy usage is low, positively encouraging them to sustain low energy household conditions. The tool also provides analytics, reports, tips and so forth.

VALUE PROPOSITION. To engage users and nudge them towards more sustainable energy usage, Greenely focuses on user experience, gamification and analytics. This user-friendly approach has already proven very successful, achieving high user engagement and energy reductions. In offering a solution to customers' utilities, such companies benefit from increased customer loyalty, enhanced marketing and enhanced digital customer communication, as well as new customer information and insight.

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THE TEAM

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Mohammed has a M.Sc. in Civil Engineering and is co-founder of Greenely.

Fredrik Hagblom
Product Manager, Co-founder
Fredrik has an B.Sc. in Mechanical Engineering and is co-founder of Greenely.

MARKET SEGMENTS

- Power DSO, Gas DSO
- Residential building
- District heating grid

CUSTOMER REFERENCES

SBAB Bank, 2 Swedish Power Utilities, Stanford University (collaboration)

B83 · **Linkener** · *Spain*

Energy solutions based on smart metering, IoT and big data for energy consultants and energy utilities

The Linkener system enables the real-time monitoring of industrial and business electricity consumption through the installation of an electronic device at the communications port of existing electrical meters. The company provides both real-time consumption electricity data and the web tools required to benefit from it. Energy consumption data is collected from main electric meters and analysed, then presented on a user-friendly web platform. The Linkener platform creates automatic reports, invoice simulations and much more. Consumption data is monitored in real time, preventing inefficiencies by sending alerts and identifying where money could be saved.

THE NEED. Energy utilities and consultants need their customers' real-time consumption data in order to make more accurate and efficient purchases and provide better services to their clients. Linkener enables them to increase profits by helping them make better demand forecasts, come up with faster solutions and improve their brand image.

THE SOLUTION. Once the electronic device is connected to the electricity meter's communication port, it starts monitoring it and sending the data on to the web server. All the data is managed in the server. Power retailers and energy consultants can use the different web applications to obtain value from the data.

VALUE PROPOSITION. Linkener's solution is custom-made to suit the needs of up-and-coming energy utilities and consultants. The web platform provides data automatically and in a faster and more user-friendly form than current market alternatives. The Linkener system increases both the efficiency and the competitiveness of energy utilities and consultants.

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THE TEAM

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Master in Industrial Engineering at UPV. Master in Energy at ITE.
8 years' experience in the energy sector. Entrepreneur since the age of 18.

Javier Servera
Master in Economics at UV.
7 years' experience in management, and international business experience in organisations such as IVEX and Deloitte.

Toni Conca
Telecommunications Engineer graduate at UPV, has extensive experience as a web developer and has worked freelance and as a co-founder in different web projects.

MARKET SEGMENTS

- Industry
- Tertiary (non-residential) building

CUSTOMER REFERENCES

Energy house, On asesores Gaiai, Energy

B84 · **Ogarniamprad** · *Poland*

An e-commerce platform that allows energy consumers to switch to the cheapest suppliers offering black or green energy

Ogarniamprad's platform offers a unique and efficient means of obtaining energy at lower prices, bringing together energy suppliers with retail (domestic and commercial) customers who are connected to the low- or medium-voltage grids. Registration takes a matter of minutes and provides access to a platform that aggregates energy packages based on tariff, location and profile, using real-time reverse auctions to automatically bid the lowest prices for renewable energy, non-renewable energy, or a combination of the two.

THE NEED. Today's energy consumers find it difficult to shop around for the best energy deals available. They have to either search for alternatives themselves among hundreds of suppliers or use price comparison websites, which are simply sales "leads".

THE SOLUTION. Ogarniamprad's platform is easily accessed: customers can register and open a free account in minutes. Based on the lowest price bid by suppliers, customers may then pick and choose, switching to new supplier and saving on energy. All formalities are dealt with by Ogarniamprad, which, to give a better picture of the venture, combines allegro, groupon and amazon.

VALUE PROPOSITION.

- Easy access to most competitive offers for black and green energy.
- Online and in real time negotiations.
- Collective and profiled purchase of dual fuel.
- Saveness - full support in switching procedure and during contract term.
- Savings - a European Commission study shows that EU consumers could save about 13 billion EUR a year.
- Certified green auctions allow consumers to buy clean energy and support the growth of renewable energy sources.

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THE TEAM

Danuta Staniszewska
CEO
A graduate of the University of Economics in Poznan, a fan of the 3rd industrial revolution associated with the energy industry, with several years in management position and 7 years working in the energy sector.

Paweł Matejak
Sales Director
A graduate of the Warsaw Technical High School, with a strong track record in sales having spent over 20 years working in sales and marketing.

MARKET SEGMENTS

- Smart energy efficient mobility
- Residential building
- Tertiary (non-residential) building

CUSTOMER REFERENCES

Cez Trade Polska, Energia Polska, Tauron Sprzedaż, Konerg

B85 · **ProInterface** · *Sweden*

Commercialised by ELSTA Elektronika

Intelligent power conditioning and monitoring interfaces for smart grid prosumers

APF is a compact, low voltage power electronics solution designed to improve selected power quality factors, mostly caused by a non-linear load in the electrical power grids. The device provides three main functionalities among others: harmonics mitigation, reactive power compensation and phase current symmetrisation.

THE NEED. Preservation of adequate electrical quality has become a major problem. Industrial plants with highly automated production lines cannot operate properly without sustainable power supply with precisely defined power quality parameters. There is therefore an urgent market need for solutions that protect energy customers from power quality disturbances.

THE SOLUTION. The aim of the project is to develop a solution to improve the conditions for the supply of electricity and the integration of distributed energy sources with the supply network. The objective of ProInterface is to deliver commercially viable power electronics solutions: an active power filter, a dynamic voltage restorer and a prosumer interface. Those solutions will gradually enable the integration of energy prosumers with a power system and maintain proper power supply conditions at the point of common coupling. The prosumer interface provides comprehensive multiple functionalities currently offered only partially by devices available on the market.

VALUE PROPOSITION.

- Increasing the reliability of industrial processes.
- Energy efficiency improvment and money saving in long-term prespective.
- Ease of use. Simplicity.
- Increased lifespan of many electronics devices.
- Increased safety due to lowering current (and temperature) in neutral wires.

ProInterface

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THE TEAM

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Krzysztof has developed his professional career in academia and industry for 8 years, holding different positions in R&D departments and marketing and project management

Grzegorz Kucia
Product Manager, MSc Telecom, PRINCE2 Practitioner

Grzegorz has developed his professional career in the energy and telecom sectors for 20 years, holding various engineering and management positions, such as designer, consultant, product, project and department manager.

MARKET SEGMENTS

- Industry

SCiBreak

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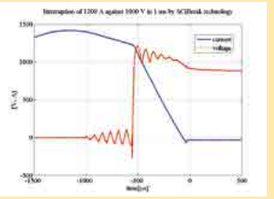

THE TEAM

Staffan Norrga
Founder SCiBreak AB, Associate Professor at KTH

Dr. Staffan Norrga has been active in the field of power electronics for more than 20 years, in academia as well as in industry. He is the inventor or co-inventor of 11 granted patents and has authored or co-authored more than 60 scientific papers.

Lennart Ängquist
Founder SCiBreak AB, Professor at KTH

Prof Lennart Ängquist has been active in electrical engineering for more than 40 years, first at ABB and later at KTH.

MARKET SEGMENTS

- Power TSO, Power DSO
- Industry

CUSTOMER REFERENCES

SvK

B86 · **SCiBreak** · *Sweden*

Ultra-fast circuit breakers for AC and DC grids at a low cost

SCiBreak is a spin off from KTH that develops ultra-fast circuit breakers for medium and high voltage based on an innovative concept that enables the interruption of fault currents in both AC and DC grids in a few milliseconds. Standard AC breakers require tens of milliseconds, during which disturbances and equipment damage may occur. Existing DC breakers for high or medium voltage are generally very costly, and our solution comes at significantly reduced cost. Patents are pending regarding the core technology.

THE NEED.
SCiBreak's technology allows for the rapid clearing of short-circuit faults in AC and DC power grids without disruptions and equipment damage. Fault currents are limited before dangerous levels are reached.

THE SOLUTION.
Like other hybrid circuit breakers, SCiBreak's solution employs a combination of power electronics and mechanical interrupting elements. The exact details of the technology are confidential, but thanks to our circuit solution the use of expensive power semiconductors can be minimised.

VALUE PROPOSITION.
Our solution is less costly compared to other hybrid circuit breakers. This is achieved by our unique technology through which the amount of power semiconductors can be reduced tenfold. These devices tend to be the most costly part of a hybrid breaker. A further advantage of our solution is that it allows for rapid reclosing so that the distortion caused by grid faults can be minimised.

B87 · **UCGEN3** · *Estonia*

Commercialised by Skeleton Technologies

Next generation ultracapacitors for energy storage

Ultracapacitors (also "supercapacitors") are extremely efficient and long-life energy storage devices with a major advantage in applications requiring peak-load shaving. Ultracapacitors store 20 times less energy than batteries, but are 100 times more powerful. Switching energy capacity for higher power and efficiency means ultracapacitors are not meant to replace batteries - although they can do so in some applications - but are meant to work with them. Target applications include heavy transport, grid and industrial solutions.

THE NEED.

This project addresses the need for a lightweight, cost-effective and powerful energy storage system. The main industries requiring such solutions are transportation, heavy industrial equipment and power grids. The envisaged product is a next generation ultracapacitor, which will meet the need for higher efficiency and a lower cost-of ownership. The performance and price levels of ultracapacitor technology have not reached a point which is sufficient to meet widespread client demand. A breakthrough is needed for the ultracapacitor to carve itself the "promised" multi-billion euro market.

THE SOLUTION.

The envisaged product is a next generation ultracapacitor, which will meet the need for higher efficiency and a lower cost-of-ownership. The key innovation with this product line is a significant increase in energy and power density. The performance advantage comes from Skeleton Technology's patented nanoporous carbon material (carbide-derived carbon, CDC). Unlike competitors, Skeleton Technologies is the only company to use an inorganic precursor to ultracapacitors. At the end of the project, there will be a finished product ready for installation and integration by a wide range of customers.

VALUE PROPOSITION.

- Lower weight and volume.
- Higher energy density and power density.
- Lower cost over lifetime.

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THE TEAM

Egert Valmra
Activity Manager

PhD in Strategic Management. Extensive work experience in programme management, programme development, impact evaluation, project evaluation, database development and innovation awareness.

MARKET SEGMENTS

- Smart energy efficient mobility
- Power TSO

"I like the format of The Business Booster very much because in a very condensed time you get to meet a lot of start-ups that have been well selected. I take a lot out of these two days"

Dr. Inken Braunschmidt, *Chief Innovation Officer,* innogy SE, innogy Innovation Hub

Smart and efficient buildings and cities

B88 · **AEInnova** · *Spain*

Renewable energy from industrial waste heat using thermoelectric generators

Thermoelectric generators have been developed that convert industry waste heat into electricity and which can be used directly for applications onsite, or re-injected into the grid. These waste heat recovery units can be installed at every chimney or pipe where heat is present, to create a modular, scalable and maintenance-free system. The additional development of an industrial self-powered wireless sensor network system for industry 4.0 allows industries to install wireless self-powered sensors that monitor their processes.

THE NEED. Industries are inefficient at using energy. More than 60% is wasted in the form of heat. Reducing the cost of the energy bill and lowering the environmental impact of energy are both essential. At the same time, industries need to monitor their processes when installing sensor grids. Wiring is very expensive and wireless solutions require batteries to feed the sensors, which can also be costly.

THE SOLUTION. An initial solution provided is sustainable and eco-friendly energy production using a by-product of the industrial process itself: heat. Converting waste into usable energy reduces energy bills and lessens the environmental impact made in industry, aligning it with the requirements of new environmental rules. The additional provision of a self-powered sensor system, that can be installed everywhere where heat is present, makes installation easier and lowers costs, as well as providing a wireless sensor platform which matches industry 4.0 requirements.

VALUE PROPOSITION. In contrast to current waste heat recovery systems based on steam-powered machines, such as the organic rankine cycle systems which are huge, very expensive and have high maintenance needs and operation costs, the waste heat recovery system is a flexible solution which can be easily installed in every industry, as it can be attached to any pipe or chimney where heat is present. The system is scalable, modular and maintenance-free with an estimated operative life of over 20 years. The system can also be upgraded with new technologies for higher performance.

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MARKET SEGMENTS

- Industry
- Smart energy
- Efficient mobility
- Heating & Cooling

CUSTOMER REFERENCES

SEAT, Repsol

B89 · **Betterspace** · *Germany*

Holistic building automation system combined with smart devices tailored to the needs of the hotel industry

Betterspace provides intelligent building automation systems for hotels as well as digital products for guest communication - all from a single source. With its holistic solutions Betterspace makes hotels smart, sustainable and more attractive by using intelligent digital solutions.

THE NEED. The hotel industry is a highly competitive and price-sensitive field. Hoteliers rely on effective and affordable technical solutions to save money, time and energy. At the same time, distinguishing features are essential for hotels to assert themselves against competitors. Besides, guest expectations have drastically changed over the years. Guests do not only expect a hotel to offer impeccable rooms and services but also the very latest technology. Here lies the major problem: In terms of digitalisation the hotel industry is lagging far behind other fields and, more significantly, behind guest expectations.

THE SOLUTION. Betterspace has developed two lines of products in order to solve these problems often faced by hoteliers. The intelligent building automation solutions provided by Betterspace simplify and optimise hotel operations while saving energy costs. At the same time, Betterspace's digital communication products, such as in-room tablets or smart displays, offer important differentiating factors to attract guests and increase hotel revenues. Thus, the hotel owner profits twice: saving money while increasing revenues.

VALUE PROPOSITION. The Betterspace system was specifically developed to meet the needs of the hotel industry. With the unique combination of products focusing on building automation and guest communication, Betterspace fills a market gap that has gone unnoticed for a long time. Several Unique Selling Propositions, such as the holistic approach of the system, its unlimited scalability its interoperability and the favourable market position allow for positive future expectations.

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Co-Founder and CMO

Benjamin Köhler
CO-Founder and CSO

MARKET SEGMENTS

- Industry
- Heating & Cooling
- Tertiary (non-residential) building

CUSTOMER REFERENCES

Parkhotel Emstaler Höhe

B90 · **Cloud Energy Optimizer** · *Netherlands*

A shell over existing building management systems that provides energy forecasting and greatly reduces energy consumption in buildings

The Cloud Energy Optimizer predicts the energy demand in a building and deploys various energy resources as efficiently as possible. The self-learning software combines all kinds of information to predict the needs of all users in the building. Based on this data, it proactively deploys the most sustainable and cheapest energy source available.

THE NEED. This system allows users to manage ever-more capricious weather fronts that cause changing conditions inside a building. Not only does it save energy, it also enhances comfort.

THE SOLUTION. All energy resources are gathered in the technical area: heat pumps, solar collectors, heat exchangers and boilers. They are controlled by a building management system. The Cloud Energy Optimizer uses an intelligent self-learning algorithm to predict the energy demand in a building 24 hours in advance and based on a local weather forecast. It thus continuously ensures the optimal distribution of sustainable energy.

VALUE PROPOSITION.

- Instant significant energy and cost reduction, of 10% to 40%.
- Extending the lifespan technical installations.
- Use of the most sustainable and-or cheapest energy available.
- Enhanced comfort.
- Contribution to sustainability goals.

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THE TEAM

Michel Tap
Managing Director
Degree in Applied Physics. 25 years experience in the energy sector. Core competence in bringing new innovative technology to the market and establishing the level of organisation required to support it.

Niels de Jong
Product Director
Degree in Business Informatics. Experience in the energy sector for 10 years in different positions in software development, innovation and product development.

MARKET SEGMENTS

- Tertiary (non-residential) building

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THE TEAM

Michel Meunier
Michel worked for multinational companies as an energy engineer for 13 years. Following that, he created Cube technologies, a software start-up company which he later sold on to Siemens. In 2008, Michel founded Albedo Énergie, a firm of energy engineering consultants.

Pierre-Étienne Meunier
Pierre initiated the development of the algorithms in Coturnix. After his PhD on theoretical computer science, he spent several years doing theoretical research on computational models, complexity theory and geometry. He also worked on parallel computing, scheduling and asynchronous computation.

MARKET SEGMENTS

- Tertiary (non-residential) building

B91 · **Coturnix** · *France*

Predictive energy management for efficient buildings and cities

Coturnix uses heterogeneous data to model the behaviour of buildings, and optimise their energy consumptions and costs based on that model in real time.

THE NEED.
Facility managers need tools to accurately predict energy needs in the long term as well as building automation to fulfil contracts in the short term. Cities and smart grids have exactly the same requirements, just on vastly different scales.

THE SOLUTION.
The company has developed statistical and machine learning tools to determine the behaviour of buildings automatically. Then, algorithms are used in order to automatically control heaters, solar power, air conditioning and so forth, in real time.

VALUE PROPOSITION.
The modelling tool used by Coturnix is among the most accurate on the market. A further advantage is that the company's team comes from diverse scientific fields, including physics, theoretical computer science and sociology. This enables the company to fully assess all aspects of possible building behaviour.

B92 · **Daylight Solutions** · *Netherlands*

E-Blinds that enable the active control of heat and light levels in buildings

Daylight Solutions develops electrostatically actuated blinds to be used in double or triple glazed windows in facades and horizontal roof-light systems. These blinds are more effective, easier to use and less prone to defects than traditional sun- and warmth- shading systems. They actively reduce the need for artificial cooling, lighting and heating and have no mechanical parts.

THE NEED.

A great deal of energy is used in the cooling, heating and lighting of buildings, energy that can be reduced if we make better use of natural sun and shade. At present, however, inadequate shading techniques are used to prevent overheating and energy-loss. These techniques are inefficient as they require maintenance and easily suffer technical defects.

THE SOLUTION.

The electrostatically actuated E-Blinds require no maintenance and have hardly any mechanical components, thus being an excellent replacement for current blind systems with pull cords and engines. Through its significant control of light and heat, this system reduces the need for artificial cooling, lighting and heating.

VALUE PROPOSITION.

- A sustainable solution for cooling, lighting and heating of buildings.
- Electrostatic control.
- No ropes, no motor, no mechanical parts and no maintenance.
- Reflects the warmth (visible and IR parts) of sunlight in gradations.
- Can be mounted horizontally or vertically.
- Ultra-low power usage.
- Very fast response time.
- Almost invisible.
- Relatively low cost.
- Unique aesthetic design.

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THE TEAM

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CTO, co-founder

MARKET SEGMENTS

- Tertiary (non-residential) building
- Residential building

B93 · **DC Brain** · *France*

Smart grid software that enables users to better understand and operate physical networks, such as gas, electricity, water, vapour and cooling systems

DCbrain is a Big Data solution dedicated to exploitation and maintenance issues of complex industrial networks (such as gas, water, electricity, logistic,...). We are now used by actors such as ENEDIS, Total, GRDF or SNCF.

THE NEED. Our clients are industrials players, networks or infrastructure managers, all of whom are keen to optimise the management of their network. The infrastructure management system currently used by exploitation / engineering teams was created to prevent major risks rather than to optimise flows. In order to do so, therefore, they are presently forced to rely on manual interventions and occasional statistical analyses.

THE SOLUTION. By using the Graphe database model, we are able to make sense of the billions of measures that derive from any complex network, thus offering an accurate digital version of this network. Our Datamining toolbox is able to detect anomalies, prevent incidents and predict the future evolution of any network.

VALUE PROPOSITION. Our main advantage is in our ability to process and visualise physical flows in real time in a comprehensive and exhaustive manner, and through a "digital network" view. DCbrain offers our users a unique visualisation interface and an effective predictive analysis toolbox that is both easy to implement (in under 2 weeks) and simple to use.

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THE TEAM

De Moissac Arnaud
CEO

An Insa & Telecom Paris graduate with 10 years experience working as a data centres operations manager. Has developed 8 patents in this field and launched one previous start-up.

Olivier-Martin François
CTO

A Telecom Paris graduate with 25 years experience working as a data warehouse operations manager. A Hadoop early adopter and trainer.

Benjamin
Business developer

ESCP Europe graduate with a business consulting experience within CAC 40 companies.

MARKET SEGMENTS

- Smart grid & Smart city
- Industry

B94 · **EBL** · *France*

Small and ultra-light electric kit for bicycles, which allows users to switch from a pedal to an electric bike in seconds

The Gboost system is an electric motor kit that includes a battery and a motor. The motor is one of the smallest and lightest on the market, weighing only 950g. It is reliable, completely waterproof and silent. The motor, that enables you to reach speeds of up to 25km/h, can be fixed under the frame and fits tires of all sizes. The powerful, new generation battery can be easily fixed on the frame. The whole kit can be quickly installed with just a few basic tools.

THE NEED.

The Gboost system targets any type of cyclist who needs or wants to go further and faster by bike with less effort. It is ideal for those who need to get between home and work and back in less time, or for those who would like to go on longer excursions.

THE SOLUTION.

In installing the Gboost system on your bike you have the choice between riding a normal pedal bike or switching to an electric one, when assistance is needed to travel longer distances at an increased speed and with less effort.

VALUE PROPOSITION.

The motor is more reliable and has a simple manufacturing format (direct drive and gearless motor). It is also ultra silent with a vector control, is ultra light (just 950g) and easy to install by the customers themselves without specific tools or special skills. Finally, the motor is very discreet, which makes the customer's bike fully usable as a normal pedal bike as well.

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THE TEAM

Dominique Houzet
Associate

Holds a doctorate in Computer Science, professor at Grenoble-INP, expert in technologies.

Guenther Hirn
CEO

Electronic engineer, manager at Hewlett-Packard, an expert on supply-chain.

MARKET SEGMENTS

- Smart energy efficient mobility
- Industry
- Municipality / District

B95 · **Ecotropy** · *France*

Simulation and measurements for better buildings energy efficiency

Buildsense is an online software platform that enables construction engineers to maximise on all aspects of a building's energy efficiency promised in its design. Perfectly suited for use in energy performance-based contracts, the platform comprises a set of tools that enable engineers to simulate, measure, verify and optimise energy performance at all stages of the construction of a refurbishment operation.

THE NEED. Even as buildings overall efficiency is increasing due to stricter regulations and governmental incentives, current approaches consistently fail to turn theory into practise. While buildings behave well according to theoretical computations in the design phase, they fail to live up to the promise after construction, and the actual efficiency of new energy-efficient buildings is 40% to 100% below the levels predicted by design. Yet the major part of this could be avoided with appropriate quality controls focusing on energy performance. Such a process, implemented throughout the construction and operation phases, involves measuring, analysing and checking buildings energy performance. However, this is a time-consuming task demanding high expertise because of the complexity and variability of the various processes involved.

THE SOLUTION. Ecotropy provides a simple and accurate system to measure and analyse the energy performance of a building. The unique combination of energy simulation software and on-site instrumentation makes the measurement and verification process more accurate and with a higher repetition rate compared to today's practices. It goes even further by providing a way to detect construction or design defects and to optimise the installation tuning.

VALUE PROPOSITION.

- Secures energy savings in the long term.
- Avoids undue over-consumption that today amounts to 40% to 100% above the targetted rate.
- For a medium-sized building of 10 000 m2, energy savings can represent up to 20 k€/year.

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THE TEAM

Alex Nassiopoulos
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PhD holder and an expert in building physics and numerical modelling.

Jordan Brouns
Co-founder

PhD in scientific computing and data analysis techniques. In charge of the development of the computational core of Ecotropy software.

Paul Vienne
Co-founder

Engineer, implied in several research projects concerning optimal energy management and the analysis of human behaviour on energy performance.

MARKET SEGMENTS

- Residential building
- Tertiary (non-residential) building

CUSTOMER REFERENCES

T4M, Solamen

B96 · **EP Tender** · *France*

On-demand range extending service for electric vehicles, using mobile energy modules attached occasionally to the EV

The Tenders will initially carry a combustion engine generator, and later a fuel cell or a battery (if and when it is light enough…). We are launching a field test in 2017 with 50 vehicles and 5 rental points, supported by H2020 SME, ADEME/CGI, ERDF and the City of Rouen. User acceptance is already proving excellent among EV owners and prospective customers. The field test will further evaluate user demand, create strong dissemination momentum and widen OEM support.

THE NEED.

Electric vehicles are unable to satisfy occasional peak range requirements. This is proving a prominent limitation to user acceptance. The marginal cost of an additional range is very high, whereas the frequency of long distances is low. These dual constraints cannot be compromised!

THE SOLUTION.

With the occasional rental of an energy module (a Tender), the owner of an EV gets access to the same range as a classic combustion engine yet at a low marginal cost (pay per use). The Tenders will be available 24/7, every 50km, in the Tender'Lib network.

VALUE PROPOSITION.

Own an affordable EV, travel 98% of the time fully electric, and benefit occasionally from the same range capacity as classic combustion engine vehicles. EP Tender is convenient to use: it attaches to the car in one go and offers easy backing without knife jacking. See a demonstration on this video. The model is pay per use, and the vehicle's payload is not impacted by the range extender.

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THE TEAM

Jean-Baptiste Segard
CEO

Graduated in 1984 from EPFL. Has been a senior executive in asset management until 2012, when he founded EP Tender.

Fabrice Viot
Systems engineer

Graduated in 2007 from ESIGELEC. Joined EP Tender in 2013 to work on embedded systems development.

Yuqi Li, Hancheng Yang, Frédéric Joint
Development engineers and business development

Graduated from ESIGELEC and INSA. The team is developing in house all the systems architecture, the algorithms and embedded software, as well as overall integration and tuning.

MARKET SEGMENTS

- Smart energy efficient mobility

CUSTOMER REFERENCES

Enedis (Erdf)

B98 · **Glowee** · *France*

What if we no longer needed electricity to produce light

Glowee has developed a biological light source that uses the bioluminescent properties of marine micro-organisms. Bioluminescence is a chemical reaction coded by genes. By enabling bacteria to make light, Glowee offers a living and lighting raw material which is self-sufficient and needs no infrastructure, thus disrupting the way that light is produced and consumed.

THE NEED.

In developing this new light source, Glowee aims to offer an alternative solution that:

- Reduces the 19% share of electricity used to light the world, which accounts for 5% of global greenhouse gas emissions.
- Povides light to people and to places that do not have access to electricity.

THE SOLUTION.

Glowee targets the retail industry and various actors of the urban landscape market, to which we offer different applications based on the use of a natural bioluminescent raw-material, able to depart from current infrastructures to produce natural light over time.

VALUE PROPOSITION.

The company offers a smooth, ecological and biological light source, with a wide potential for use in the retail industry and in urban landscapes.

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THE TEAM

Sandra Rey
CEO

Geoffroy de Bérail
CFO

Samuel Juillot
CSO

MARKET SEGMENTS

- Smart energy efficient mobility

B99 · **Gradis** · *Poland*

Outdoor lighting market designed to save energy, reduce CO_2 emissions and guarantee compliance

PhoCa is a new approach to selecting appropriate street lighting: luminaires, their distribution, placement and further management. The use of proprietary software algorithms can amount to energy savings of over 70% for a single installation. The end result is energy-related maintenance cost reduction (or an increase in the margin for operators in the case of permanent contracts for maintenance), CO_2 reduction and a reduction in operating cost related to energy consumption and lighting infrastructure management.

THE NEED. More than 20% of the world's energy is consumed by lighting. Any energy savings in this area have a tremendous impact on operating cost reduction and CO_2 emission reduction. Before a lighting installation is deployed all luminaires, their parameters and distribution have to be chosen, that is, designed. Lighting infrastructure operators or owners preparing for retrofitting or the design and construction of new lighting installations require the designers and suppliers to support the improved efficiency of lighting systems, decreased time and expenditures on the design phase, decreased maintenance cost and satisfactory ROI.

THE SOLUTION. Design and support services based on proprietary PhoCa software enable the deployment of optimised and well-tailored lighting systems which comply with operator's needs, such as minimised energy consumption and legal regulations. Additionally, the software enables both the designer and the operator to easily review alternative scenarios of the lighting system layout and operations that are already at the design phase. Gradis offers unsurpassed design quality based on precise photometric calculations, and quick delivery. For example: preparing a regular design for 6000 light points takes approximately 2 weeks, while a higher quality, optimised design can be obtained from Gradis in just 2 days.

VALUE PROPOSITION. Energy savings, quick design delivery, compliance with regulations.

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THE TEAM

Leszek Kotulski
PHD, DSC - CIO
Chair of the Department of Applied Computer Science at AGH University of Science and Technology.

Artur Basiura
CEO, Product Manager
Programme Manager with experience in business development. He cooperated with companies such as Asseco, Orange, T-Mobile.

Artur Jaworski
Head of Business Development
15 years experience in international IT business development in both corporate and startup environments. Track record in managing business development for smart city solutions across Europe.

MARKET SEGMENTS

- Municipality / District
- Industry
- Smart energy efficient mobility

CUSTOMER REFERENCES

Schreder, GE Lighting, AGH University of Science

B100 · **Heaboo** · *Portugal*

A passive device for the stagnation temperature correction of hot water distribution systems in buildings

Heaboo has developed a disruptive solution for the stagnation temperature correction of hot water distribution pipes in buildings that is compatible with conventional heating and DHW distributing systems. The solution is based on the storage of heat in specific points of the building, where Heaboo devices will be placed to avoid the need to recirculating hot water circuits or any other systems based on local water heating or recirculation.

THE NEED.
Hot water distribution systems in buildings have a problem related to the response time of the hot water in the distribution network, and conventional solutions limit energy and water efficiency significantly.

THE SOLUTION.
Heaboo is a standalone device that corrects the response time of the hot water distribution systems passively, saving the energy that would otherwise be wasted with recirculating circuits, or the water wasted while waiting for it to heat.

VALUE PROPOSITION.
The Heaboo device corrects the stagnation temperature of hot water distribution systems in buildings avoiding the utilisation of recirculating circuits, with an average saving of 30% on the global energy spent on water heating. In buildings without recirculating circuits, this device can correct the response time of the hot water with a consequent reduction of water and energy consumption.

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THE TEAM

Rui Teixeira
CEO
RUI has a PhD in energy engineering and degree in mechanical engineering with 4 years' experience in R&D and project management. He has worked in the medical device industry and solar façade for buildings.

MARKET SEGMENTS

- Residential building
- Tertiary (non-residential) building
- District heating grid

COLLABORATIONS

University of Aveiro

B102 · **Ibertherm** · *Spain*

Machinery for industrial cooling, climate and heating using natural gas as a primary energy

Ibertherm Group S.L. designs and produces efficient machinery for industrial air conditioning, heating, hot water and refrigeration using Natural Gas as a primary energy. All our equipment allows for heat recovery from our natural gas engines to produce heating and hot water at 65°C, while also producing the other industrial processes. Ibertherm equipment reduces the final economic cost and also reduces the harmful environmental emissions of our clients.

THE NEED.

Ibertherm reduces the amount of energy (such as electricity or natural gas) that many companies need to produce industrial air conditioning, heating, hot water and refrigeration. IBERTHERM also reduces the final economic cost that arises from such production.

THE SOLUTION.

We unite and produce air conditioning, heating, hot water and refrigeration in one technology, using cheaper energy such natural gas as a primary energy and always getting heat recovery from our engines to produce heating and hot water at 65°C while also producing other processes.

VALUE PROPOSITION.

Compared to our main competitors we are more efficient, producing savings on the economic cost on production of air conditioning, heating, hot water and refrigeration and also producing savings on the economic cost on electric power term. Our products are tailor fitted and adjusted to our customers and always use heat recovery from our engines; that means savings on the demand on primary energy and reducing the CO_2 and SO2 emissions.

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THE TEAM

Marc Cañellas
CEO
Interested in the implementation and application of technological and ecological issues. Specialist in the industrial sector, with over 8 years spent researching and implementing energy efficiency systems to reduce costs and emissions.

Jan Puig
Interested in the energy problems of today's society. Architect with over 10 years' experience in the field of energy efficiency in buildings and cities. Product design. Green building experience and LEED certifications.

MARKET SEGMENTS

- On-shore wind

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THE TEAM

Marcel Cloosterman
Responsible for overall business development and project management.

Bas Rongen
Responsible for hardware development of the MonBox.

Laurens v. Riel
Responsible for the software development of MonBox, database and dashboard.

MARKET SEGMENTS

- Residential building

B103 · **Ik ben Ra** · *Netherlands*

Web-based low-cost monitoring system for solar thermal systems

Ik ben Ra has developed a low-cost monitoring system for solar thermal systems. It covers the most important parameters of the solar thermal system's operations, such as temperature, flow, pressure and generated heat, as well as highlighting errors so that corrective measures can be taken immediately.

THE NEED.

Up until now, solar thermal systems have been operated by control units that are often difficult to program by non-specialists and are located near hot water storage facilities in less accessible locations, such as in the attic, basement or garage. This makes it difficult for owners to check the performance and yield of their system.

THE SOLUTION.

As our dashboard can be consulted anywhere and on any device, errors can be noticed much earlier. Solar thermal system owners can be made aware and also demonstrate the advantages of buying such a system, convincing others to invest in similar technology. Energy savings can be made through proper planning of the heat consumption in the home.

VALUE PROPOSITION.

- Easily accessible presentation of the performance of a solar thermal system.
- Low-cost, applicable for the consumer market.
- Can be connected with solar thermal systems of different suppliers.
- Applicable to installers for maintenance and error reporting.
- Improves the performance of solar thermal systems.
- Supports the growth of the solar thermal market.
- Accumulates data on the actual performance of solar thermal systems.
- Suitable for producers, retailers and owners of solar thermal systems.

B104 · **IonSeed** · *Portugal*

IOT network for distributed energy management and storage

Ionseed is a high performance Internet Of Things (IOT) infrastructure for distributed energy management and storage enabling disruptive new concepts that will dominate the energy market in the next decade, such as Reactive Energy Management, Distributed Energy Storage and Virtual Power Plants.

THE NEED.

Renewable energy production is characterized by a variable power output, with energy being produced at times when the end-user may not need it. This out-of-phase demand and supply behavior poses control problems and stress on energy grids and generates a lot of inefficiencies.

THE SOLUTION.

With IONSEED energy providers decide when, where, how much and what energy type is used by the consumer. This is done by defining energy management rules targeting energy storage devices in a IOT platform that communicates with proprietary hardware embedded in several consumer products.

VALUE PROPOSITION.

Enable service and energy providers to reduce costs and increase revenues, develop new products and add more value to clients. Manufacturers transform a traditional passive device (ex. hot water vessel) into a cutting-edge reactive appliance that is able to interact with different players in the value chain. End-users benefit through more information, better maintenance services and a reduction of their energy bill.

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THE TEAM

Joao Pinto
CEO

Mechanical Engineer. Created successful enterprises in health and R&D. Has also worked in renown companies in the thermal and aerodynamics fields.

Pedro Pinto
CTO

Computer Engineer and technology visionary. Worked in renown multi-national companies in the IT and telecommunications sector.

MARKET SEGMENTS

- Energy storage solutions for the grid
- Heating & Cooling
- Solar PV

CUSTOMER REFERENCES

EDP, VPS, SIMPLES ENERGIA

B105 · **LOWTE** · *Sweden*

Energy active window (BIPVT) and ground energy storage for plus energy building

LOWTE is developing, manufacturing (niche market), marketing and licensing building envelope components called DS-BIPVT (Double Slot – Building Integrated PV Thermal) and a new type of borehole heat exchanger. The DS-BIPVT can be implemented in different parts of the building envelope (windows, roof). It is a prefabricated elements but might be erected in situ too when it comes to the roof. The product is of interest anywhere in the world in which there is a need for heating and cooling, or just cooling.

THE NEED.

At present, the building needs to be energy efficient and offer a comfortable indoor climate despite large windows. BIPV (Building Integrating PV) also requires ventilation to keep temperatures from getting too high.

THE SOLUTION.

LOWTE solves these problems with BIPVT (Building Integrated PV, that is Thermal cold) and a new generation borehole heat exchanger. The BIPVT solution can also be connected to district heating and heat, and thus offers energy efficient indoor comfort regardless of the energy source.

VALUE PROPOSITION.

Typically windows are passive components that cause high-energy consumption and bad indoor comfort both in summer and winter. LOWTE solves this problem with an energy active window that acts as a heat radiator during winter and a cooling panel during summer. The energy (low-Exergy Energy) that is used can be harnessed from different (renewable) energy sources that are very cheap. The cost is, in most cases, offset by the replacement of alternative technology that also has substantial running costs.

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THE TEAM

Peter Platell
Tekn Lic, CEO

Peter has 30 years experience in energy industry, R&D and marketing and 15 years experience in marketing new disruptive technologies.

Ove Platell
Senior Technical Advisory

Formerly worked as a rocket scientist in the US, the project leader for SAAB's steam engine project in the 1970s, and the inventor of LOWTE technology.

MARKET SEGMENTS

- Solar PV
- Heating & Cooling
- Tertiary (non-residential) building
- Residential building

B106 · **NRGLed** · *Netherlands*

Real Power to LEDs: a breakthrough in LED drivers

NRGLed offers a breakthrough in LED driver technology, replacing current drivers, considered to be the Achilles' heel of LED lighting, with highly-innovative LED drivers that are economical in price, lower in volume, weight and waste, yet more reliable and more versatile. In essence, NRGLed has developed a revolutionary solution that in terms of size, function and cost matches that which occurred in the cell phone market - but in one single leap.

THE NEED.

The design of a LED lamp is unbalanced: the lifespan of the LED far exceeds the lifespan of its electronics. The market needs a decrease in lamp price without decreasing the overall quality.

THE SOLUTION.

NRGLed's patented solution abandons traditional approaches and provides constant power with temperature driven feedback. This approach eliminates lifetime limiting components and needs fewer components.

VALUE PROPOSITION.

Buyers select based on price and quality. Designers opt for driver dimensions that do not limit their options. Users expect light to be smart. Drivers from NRGLed satisfy these needs BEING lower in price, volume, weight and waste, with higher reliability and versatility. Furthermore, there are options for additional channels, intelligent light control and sensors, with very few additional components required.

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THE TEAM

Paul van den Biggelaar
CEO

Developed his professional career in the high-tech product development sector with senior management positions at Lucent Technologies, Peek Traffic and Nucletron.

Laurens Sneujink
CTO

With degrees in Product Design and Technical Computation, he has been an entrepreneur for over 25 years and is the original developer of the driver concept. He holds 7 patents and several designer awards.

B107 · **Octosis** · *Netherlands*

Smart integrated building infrastructure and LED lighting systems

Octosis develops technology for the creation of smart buildings, integrating infrastructural systems such as power, telephone, data and illumination.

THE NEED.

In order to reduce energy consumption and lower its accompanying costs, owners of buildings need better information on the management of their operational and infrastructural systems.

THE SOLUTION.

Octosis systems use an innovative 'DC Power over Ethernet' (PoE) cabling system that combines both power and data communication between various functionalities within an infrastructural system. This can be applied to several techniques, such as power, telephone, data, illumination, all kinds of sensors: movement, light, temperature, occupancy, CO_2, fire..., heating, ventilation and air conditioning. The systems will be made available in a basic, medium and premium solution format.

VALUE PROPOSITION.

- At least 50% reduction in energy consumption and hence in CO_2 emissions.
- Reduced resource and installation costs.
- Improved management tools.
- Lower operational and maintenance costs.

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THE TEAM

Octosis core team consists of four experienced professionals with complementary knowledge and skills related to entrepreneurship, marketing, technology development, management and finance.

MARKET SEGMENTS

- Tertiary (non-residential) building

B108 · **OGGA** · *France*

The most viable solutions for the intelligent energy management of housing

OGGA designs, develops (fabless) and markets a range of innovative solutions for the intelligent energy optimisation of housing. OGGA aims to revolutionise energy management in homes and to become a key player in the new house building and renovation sector. With 'Eco-Touch' it offers an intelligent product that is both easy to use and install.

THE NEED.

The cost of energy in homes is continually increasing and home automation solutions for the management of energy are too expensive for property developers. Additionally, the building need to be smart with scalable and open solution.

THE SOLUTION.

Eco Touch optimises energy consumption automatically and in doing so saves energy, by:

- Controlling a heating system based on the specific habits of residents.
- Switching off standbys and lighting during absences.
- Additionally, Eco Touch makes the housing ready to service for adding service like smart building, and service to the facility management.

VALUE PROPOSITION.

A connected solution (thermostat, energy meter and circuit breaker) that is:

- Easy to use (self-learning, optimising heating in real time).
- Easy to install (no configuration, no programing).
- Saves energy (reduced rental charges).
- Adopts a first level of home automation that is available to all.

Eco Touch allows developers to meet RT2012 standards while offering smart connected homes and respecting the requirement of cost control.

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THE TEAM

Stéphane Gagnat
Chairman / Technical director

Laurent Oger
Administration and Finance

Patrice Bouchand
R&D

Pascal Frottier
Business developer

Vincent Rousseau
Communications & Marketing

MARKET SEGMENTS

- Residential building
- Social housing

CUSTOMER REFERENCES

Bouygues, Eiffage, bpd
Marignan, Grand Lyon Habitat

B109 · **Active Insulation** · *Netherlands*

Switchable and intelligent insulation to cool and heat buildings by natural processes

Active Insulation develops switchable and intelligent insulation to cool and heat buildings by natural processes. When a building gets too warm indoors while outdoors it is cold, Active Insulation enables the insulation of a building to be 'switched off' until the building has cooled down to the desired temperature. When this ideal temperature has been reached, insulation can be switched on again retaining a comfortable temperature level inside.

THE NEED. Combined with internal heat sources, such as heat generated by human beings or by computers and other machinery, ever-thicker insulation often causes the building to overheat. This is most often combated by using air-conditioning resulting in using additional energy and incurring its costs, even when the building is fully insulated.

THE SOLUTION. Active Insulation adds an on / off function to insulation. A groove or channel structure is added to conventional hard insulation boards and a forced ventilation switch is placed between both surfaces, allowing for heat or cold to flow from outside to inside, or vice versa. When an intelligent control system with temperature sensors drives the switch, the insulation becomes an active element of the building's heating and cooling system.

VALUE PROPOSITION. Use the natural temperature outside to heat and cool buildings. Substantial energy savings, up to 30%. Avoid artificial cooling and heating. A completely closed loop, without external piping or air channels. Possibility to cool buildings during summer nights without opening doors or windows.

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THE TEAM

Eugene Peeters
Founder

Provides advice and management for small and large construction projects in industry, utilities, residential and office construction.

Rine Dona
Design and Engineering

Provides advice on complex technological issues. He has worked at Philips Research institute "NatLab" for over 30 years.

MARKET SEGMENTS

- Residential building
- Tertiary (non-residential) building

B110 · **Place to plug** · *Spain*

A platform that connects electric vehicle drivers with charging points

Place to Plug is a software company that offers an online platform and a mobile app that locates and connects electric vehicle drivers with charging points, or hosts (businesses, institutions or individuals) that have sockets available to charge their electric vehicle.

THE NEED.

'Range anxiety' is a major concern among drivers of electric vehicles. A map indicating charging points may not be enough to reassure drivers who are running low as charging points within range may be out of order, or a specific card may be needed for the vehicle to charge.

THE SOLUTION.

Place to Plug consists of a platform that enables electric vehicle drivers to know the status of specific charging points' and enables them to activate such points from their smartphone. Users will also be able to book the charging points.

VALUE PROPOSITION.

- With Place to Plug, electric vehicle (EV) drivers pay a subscription that will add them to an exclusive EV club. This enables them to activate all charging points included on the platform. Users also pay a fee for each charging point booking. This cost can be assumed by the host in certain cases (if the host is a business or institution, for example).
- It offers EV drivers the possibility of checking a charging point's status, activating it from their smartphone and booking a charging point at a specified date and time, which will ensure that the user will be able to charge then, and not find anyone occupying that space. EV drivers are usually willing to pay for this service.

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THE TEAM

Josep Cester
CEO

Josep is a sustainability enthusiast. He has experience in managing teams and in innovation and technology development, and he has been trained in business creation and acceleration skills.

Marc Ruiz
CTO

Marc is a committed, creative-thinking software engineer. He founded his first venture at 15 and has been known for his great success in his projects as an entrepreneur.

David Pàmies
CFO

David passion is environmentally friendly technology. He holds an MBA and a Master in Security in Information and Communication Technologies. Place to Plug is the third company he has founded.

MARKET SEGMENTS

- Municipality / District

CUSTOMER REFERENCES

Estabanell Energia, Municipality of Barcelona

B111 · **Plactherm** · *Spain*

Smart underfloor heating system

Plactherm is a revolutionary smart underfloor heating system, controllable remotely, highly efficient, compatible with renewable energies, environment friendly and, most importantly, able to generate independent thermal zones. Each worker will be able to enjoy his ideal comfort temperature, with improved performance and savings of over 30% energy consumption. The system can be controlled through the cloud using an intuitive application.

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THE TEAM

Lluc Martí
CEO

Multifaceted engineer with 2 MsC (Project management and Motorsport). Lluc created 2 previous start-ups and is CCO in another.

María Saleta Nistal
Hardware Engineer

Electronics engineer with MsC in automatisation of industrial process, specialised in the development of hardware/software for domotic systems.

Pol Zuriñach
Product & Materials Engineer

Product engineer specialised in materials, CAD&CAE. Has previous experience creating a start-up and is involved in another one.

MARKET SEGMENTS

- Tertiary (non-residential) building
- Industry
- Residential building

CUSTOMER REFERENCES

Endesa, Ferrovial, Repsol

THE NEED.

It has previously not been possible to create different comfort areas in a room (different zones with different temperatures).
Up to now, the most common systems warm from top to bottom in contrary to the ideal method of warming.
There has been no usable data to improve customer use and no form of controlling heating remotely.

THE SOLUTION.

We have created a tile with a resistor element and embedded sensors, an isolation layer and a structure with electronics, to achieve the first heating system that can be controlled remotely. It is highly efficient, compatible with renewable energies, has sensors and is able to create thermal zones.

VALUE PROPOSITION.

We are creating the most comfortable, intelligent and efficient heating system. Our patented technology is disruptive and will have a big impact on the market: heat + domotics + software analysis for the highest efficiency and relevancy of information for the user, as well as for other stakeholders - while also achieving savings.

B112 · **Sepin** · *Poland*

Simplifying energy and utilities processes by innovation

Sepin helps retail utilities in business and operational processes resulting in reduced costs, increased customer engagement and increased sales. The venture provides metering data and unique data about energy customer behaviour which can be used by marketing, sales and project teams to create personalised offers, real-time promotions and campaigns.Sepin also optimises other processes, such as master data management, billing and invoicing, and strategy planning and reporting. Utilities are made ready for digital transformation.

THE NEED.

There are four main problems facing utilities today: 1. a lack of tools to digitalise business, 2. decreasing sales, 3. increasing costs and 4. lack of knowledge about customers.

THE SOLUTION.

Sepin's solution is cloud based and it brings big data analysis, IoT integration, mobile app and customer engagement tools to the target customer: retail utility companies. Additionally, beacons are used to bring real-time metering data from energy meters.

VALUE PROPOSITION.

- New contact channel with customers.
- Proactive customer engagement and better response with access to timely data.
- Cross sell and up-sell - new sales channel.
- New tariffs based on real-time data (e.g. time-of-use).
- Reduced assets risks.
- Reduced costs (e.g. data collection cost).

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THE TEAM

Marcin Łapa
Project leader

Marcin studied at Harvard University and MIT. Experienced CEO, CIO and IT manager. Over 15 years of experience in the global utility market.

Bartosz Trzciński
Sales leader

Degree in Management at Nicolaus Copernicus University. Experienced business development and sales manager. New technology and social media geek.

MARKET SEGMENTS

- Smart energy efficient mobility

B113 · **Sit&Heat Sports** · *Netherlands*

Energy efficient outdoor heating system integrated in seating

Sit & Heat Sports develops and markets electrically-heated seat cushions as well as fully integrated electrically-heated seats. Sit & Heat can deliver custom-made cushions for private use, for the leisure and hospitality industry, or for sports stadiums.

THE NEED.

Spectators wish to continue to enjoy watching live sport in a stadium atmosphere, yet also in comfort and warmth. Current stadium seating areas are heated by extremely inefficient and costly gas heaters.

THE SOLUTION.

Sit & Heat Sports has developed heated stadium seating that is 95% more energy efficient and much more comfortable than the conventional means of using gas-powered radiation heaters. Sit & Heat Sports can deliver fully-heated integrated plastic stadium seats.

VALUE PROPOSITION.

When compared to traditional heating systems with gas heaters, Sit & Heat Sports seats are:

- 95% more energy efficient.
- More comfortable.
- Operate at considerably lower cost.
- Considerably less CO_2 emissions.

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THE TEAM

Jorg Rijkschroeff
Founder, Business/Product Development

Education: BA, Bachelor Industrial Product development – HAN (NL) Kauffmann Global Entrepreneurship Program – Kauffman Foundation (USA) Entrepreneurship – HAN (NL).

Paul Schurink
Technical Development, Project Management, Financial Management

Work experience: Bredenoord (1992-2013), Service Engineer, Logistic, Rental and New Business Manager.

MARKET SEGMENTS

- Tertiary (non-residential) building

B114 · **Smartroof** · *Belgium*

Produces and installs solar roof tiles with integrated photovoltaic elements, known as Suntiles

Smartroof is a Belgian company that develops, produces and installs solar roof tiles. Smartroof Suntiles have an integrated photovoltaic element and are able to be used for renovation and construction projects alike. Thanks to their low weight the tiles are suitable for both existing and new roof structures.

THE NEED.

While a great deal of people are interested in solar energy many are not keen on the aesthetics of standard solar panels. Smartroof Suntiles offer an alternative.

THE SOLUTION.

Smartroof Suntiles are completely integrated into the roof, making the photovoltaic elements look very aesthetic and natural. They can be combined with several types of 'classic' tiles (Neopan/Renopan, ceramic). Integrated cooling channels result in an important increase in efficiency and lifespan.

VALUE PROPOSITION.

- Aesthetic solar panel solution.
- Easy to install, no special chassis needed.
- Smooth integration with 'classic' (ceramic) roof tiles.
- Partly made from recycled materials: cradle-to-cradle.
- BIPV with internal cooling solution and heat recuperation.
- Cost-effective: financial return in 10 years.
- Easy to repair.
- High efficiency: 125 Wp/m²; full energy coverage is possible.
- Modular solution: electrical circuit formed by clicking all tiles together.

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THE TEAM

Clement de Meersman
Chairman

Lode Herreweghe
CEO

Michel Deneire
CTO

MARKET SEGMENTS

- Residential building
- Energy storage solutions for the grid

CUSTOMER REFERENCES

Sibomat, Vlassak Verhulst,
more then 100 installations

B115 · **SoundEnergy** · *Netherlands*

Cooling and heating building with hot water with zero CO_2

SoundEnergy developed a combined heat engine and heat pump. This Thermo Acoustic Energy Converter THEAC-25 which alloys us to cool building with hot water gained from the roof by Vacuum Tube Collectors.

THE NEED.

Acclimatising building consumes 25% of all the energy needs worldwide. Most of this energy is provided with fossil fuel. Which gives a high CO_2. The main part of this energy use is taken for cooling building.

THE SOLUTION.

Maximum 250 characters. You could add charts – images - pictures.
SoundEnergy developed a Thermo Acoustic Energy Converter running on hot water to cool your building. No electricity needed.
With sustainable performance specs.: Zero CO_2, Zero Global Warming Potential (GWP), Zero maintenance and no moving parts with a lifecycle up to 30 years.

VALUE PROPOSITION.

Cooling Building with zero CO_2 by using hot water gained from the roof of your building or industrial process. SoundEnergy introduces the Thermo Acoustic Energy Converter, the THEAC-25. A combined Thermo Acoustic Heat Engine/Heat Pump. Easy to fit in existing building acclimatising systems. Main benefits are:

- Zero CO_2
- Zero Global Warming Potential
- No power consumption
- No moving parts
- No Maintenance
- Long lifecycle up to 30 years

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B116 · **Stimergy** · *France*

Designs, installs and runs energy neutral datacenters integrating them in smart cities

Stimergy redefines the datacentre as a distributed collection of computing units interconnected by optical networks. Each unit, denominated a 'digital furnace', integrates several high performance servers as its heat source. Our data furnaces are deployed within the secured technical rooms of buildings, where they deliver their heat to hot water distribution pipes. Each 2 to 4kW furnace can cover 60% of the hot water energy needs of a residential building.

THE NEED.
In Europe alone, in order to run digital services such as social media, numerical simulation, web hosting and cloud applications, datacentres consume as much energy as that of an entire country the size of The Netherlands – and consumption is set to double by 2020.

THE SOLUTION.
Stimergy recycles all the energy consumed by its datacentres, making our digital world energy neutral.

VALUE PROPOSITION.
We sell an energy-efficient solution that provides the heat generated by our servers for free. Our customers benefit from this free heat for hot water production all year long, which can significantly decrease their energy bill. It represents a 60% saving on the first energy consumption post of new residential buildings. We also guarantee their return on investment.

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THE TEAM

Christophe PERRON
President and founder
Sound experience in semiconductor component energy management, IT system administration and project management, he has been working for 4 years in innovative start-up environment interfacing its technical team.

MARKET SEGMENTS
- Industry
- Municipality / District
- Heating & Cooling

CUSTOMER REFERENCES
Paris Municipality, OPAC38, Nantes Habitat, Nexity, SNCF, Lyon 3 Univ.

B117 · **Stratergia** · *Ireland*

Non-invasive energy and performance measurement and management of the entire data centre energy chain

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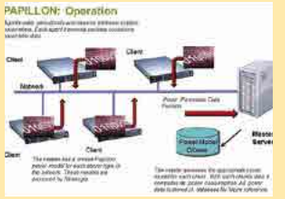

THE TEAM

Damian Dalton
CEO/CTO
Assoc Professor in School of Computer Science, University College Dublin. Lectures on Computer Architecture and Innovation and Entrepreneurship.

Abhay Vadher
Projects Director
20 years' experience in product development in several multi-national micro-electronic and IT companies.

Johan Parmar
Software Architect
18 years lead architect and programmer for several start-up projects in Stockholm. Extensive experience in team management and product development.

CUSTOMER REFERENCES
University College Dublin, Netherlands Open University, Kajaani University

Stratergia's patented software-based technology, Papillon, measures the entire energy-chain, monitors performance and reduces energy consumption in the data centre. With this technology Stratergia proves its commitment to excellence and innovation, creating energy management tools that are rapid to install, intuitive to use, and readily customisable to the requirements of all data centre stakeholders, be they involved in strategic decision-making or in effective tactical actions.

THE NEED. Inefficient data centre energy management has led to some 40% over-investment in capital equipment worldwide, at a cost of $30 billion, a 30% annual waste of electricity that costs Europe alone some $8 billion a year, and global emissions of 330 $MTCO_2e$.

THE SOLUTION. Stratergia's Papillon technology automatically identifies where energy inefficiencies exist in the data centre IT infrastructure, proposing energy-saving actions and quantifying the benefits of these actions based on actual measured operating costs.

VALUE PROPOSITION. Papillon gives data centre energy visibility and analysis at rack, server, virtual machine, application and service levels. Operational and strategic decision makers can explore energy-saving solutions, performance metrics and costs in the context of physical and business-defined objects. Furthermore, Papillon is a software solution with rapid deployment, requiring no downtime or retrofitting.

B118 · **Sunridge** · *Netherlands*

Ridge integrated solar energy system

THE NEED.

The existing renewable solutions for domestic hot tap water systems still have a lot of room for improvement: the only available solutions are large volume systems that combine poor aesthetics with a strict limitation to south-oriented roofs.

THE SOLUTION.

The product 'Sunridge' aims at dwellings where the orientation and/or the slope of the roof is not suited for solar collectors, using the ridge of the roof as mounting area. By integrating the hot water tank in the solar system, no extra space in the building will be needed to store the heat.

VALUE PROPOSITION.

- Improve the performance of renewable hot water systems
- Make an inherent safe product for overheating and freezing
- A simple and scalable solution thanks to the ridge integration
- Suitable for both new and existing dwellings
- Robust and quick connection thanks to the modules

B119 · **Textil Energy** · *Spain*

Designs and commercialises portable solar products with light and flexible photovoltaic technology, outsourcing production

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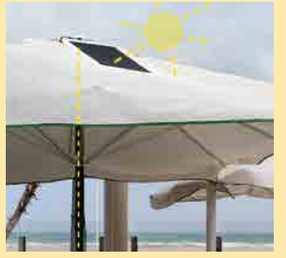

Two main products have been developed. The first product, SunMobile, makes use of existing terrace umbrellas on which a solar module is placed that allows smartphones to recharge through a charging box. The charging box can be customised into the shape of a can. A second product, EcoOne, is an umbrella comprised of a small solar panel integrated into a customised fabric that stores solar energy in ion lithium batteries enclosed in the pole. Customers can charge their smartphones directly through USB ports.

THE NEED. It is currently almost impossible to locate sources of energy outdoors that allow one to recharge the battery of personal devices, causing a great deal of stress.

THE SOLUTION. Textil Energy has developed a series of solar products and projects to solve energy problems at an individual level. The aim is to make each individual 'energy-independent.

VALUE PROPOSITION.

- High quality products with the most advanced solar technology available on the market.
- Customisation of solar products.
- High flexibility and adaptability.
- Quick delivery, with 25 days average required to customise products and deliver to customers, compared with competitors' 60-day average delivery time due to such company's more rigid hierarchical structure.
- Competitive pricing – from 30% to 50% saving on competitors' products.

THE TEAM

Juan Toribio
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Juan Demetrio Chillaron
COO

David Montoro
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Jesús Nieto
CTO

MARKET SEGMENTS

- Industry
- Solar PV
- Municipality / District

CUSTOMER REFERENCES

Carrefour, Estrella Galicia, Cargatel, Shades Collection, Zerosmog,...

B120 · **ThermoSmart** · *Netherlands*

An attractive, easy to program, smart online thermostat

ThermoSmart is a sleek and user-friendly smart Wi-Fi thermostat. It is very easy to operate, both at home and remotely - anytime, anywhere, via smartphone, tablet or computer. The product is independent of energy suppliers and boiler manufacturers. Privacy is highly-valued and there is no monthly fee and no subscription; consumption data is, of course, properly secured.

THE NEED.
75% of Dutch homeowners heat their houses when they are not at home. This is simply because they don't understand their thermostat and find it a hassle to program. Additionally, most thermostats have a bad interaction design and are aesthetically unappealing.

THE SOLUTION.
Thermosmart's solution is an easy to program, good-looking thermostat. With hassle-free programming, consumers can easily save up to 20% on their heating bills. With the appeal of a gadget, people will use it more often and even find it fun!

VALUE PROPOSITION.
- Intuitive and super easy with an Outlook/Google-style drag and drop user interface.
- Attractive design.
- Helps to save up to 20% on heating costs.
- Open innovation: public API, IFTTT channel.
- Privacy guaranteed.
- Compatible with: All OpenTherm and on/off central heating boilers, heating and district heating. Can be operated from every computer, laptop or tablet, iPhone, Android and Windows smartphones. IFTTT, public API.

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Kodjo Kouwenhoven
Co-Founder, CDO

Niels Mathlener
CMO

MARKET SEGMENTS
- Residential building
- Smart energy efficient mobility

CUSTOMER REFERENCES
Amazon, CoolBlue, Apple Premium resellers, Bol.com

B121 · **Vaventis** · *Netherlands*

Unparalleled heat recovery ventilation using highly conductive copper rather than plastic conducts

Improving the insulation of homes is essential for energy efficiency worldwide. Well-insulated homes are draught free, and therefore need to be ventilated mechanically. Such ventilators need to be able to recover heat otherwise energy is wasted. Fresh-r® is a mechanical heat recovery ventilator (HRV), also known as a mechanical ventilation heat recovery (MVHR), which offers an unparalleled performance, letting fresh air in but keeping the chill out.

THE NEED. Home owners and architects that are looking for a mechanical heat recovery ventilator (HRV) that want to save energy, lower costs and create a comfortable and healthy indoor atmosphere.

THE SOLUTION. Fresh-r® has a copper heat exchanger rather than the usual plastic one. As copper conducts heat a thousand times better than plastic, the Fresh-r® heat exchanger requires less pressure, less power, and is quieter and more energy efficient than the competition. It is also much smaller - fitting directly into the wall. The lightweight unit is easy to install and maintain with clear instruction videos. Fresh-r® has a C02 sensor and only ventilates when needed, and with the exact amount of power required.

VALUE PROPOSITION. Eco-friendly and people friendly, the Fresh-r® keeps CO_2 levels at a healthy level with unparalleled heat recovery ventilation, saving up to 100 percent of energy used for heating. Its patented copper core conducts heat multiple times better than plastic. In combination with CO_2 sensors, it is the most cost effective solution for energy retrofits, according to an international Passive House jury.

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MARKET SEGMENTS
- Tertiary (non-residential) building

B122 · **vilisto** · *Germany*

Through integrated presence sensors the thermostat learns when a room is being used and adjusts the room temperature accordingly

The company vilisto makes saving energy easy and comfortable. With 'ovis', a self-learning smart radiator thermostat, an easy-to-use solution is provided that increases living comfort while saving energy. The heating control is fully automated and requires neither manual control nor an app to work. Through integrated presence sensors the thermostats learn when a room is being used and adjust the room temperature accordingly.

THE NEED.

Solutions that enable significant energy savings.

THE SOLUTION.

The innovative ovis runs fully automated, as self-learning algorithms receive data from integrated presence sensors and take weather data into account. A compact solution without external sensors, ovis is both subtle and simple to install.

VALUE PROPOSITION.

As the only radiator thermostat on the market with integrated presence detection, ovis offers a compact product design, which allows for the shortest payback period on the market, while significantly increasing the living comfort for its users. It is, by design, easy to use and install, doesn't necessarily need an app to work, and keeps all data safe at home - cloudless.

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Christoph Berger
Business Development Manager instead of Product Development Manager

Lasse Stehnken
Managing Director and Hardware/ Software Development Manager

Christian Brase
Managing Director and Sales Manager

MARKET SEGMENTS

- Heating & Cooling
- Residential building
- Tertiary (non-residential) building

CUSTOMER REFERENCES

Eisenbahnbauverein Harburg e.G.

B138 · **Smart Home Solutions** · *Poland*

A wall plug for smart meters

An electric wall plug with an m-bus and wifi connectivity interface (other interfaces can be implementated if necessary). Cloud big data storage. App and www. interface with various reports. The app enables the control of smart home devices and set scenes.

THE NEED.

Currently there is no clear benefit of smart metering for the end user.

THE SOLUTION.

The wall plug enables the collection of online data from all smart meters. The data is stored in the cloud and an end user is able to access energy usage through an app or web interface. Big data can be analysed by the end user. Reports, such as energy usage patters, fixed usage, usage picks, energy source efficiency and benchmarks, including current home appliances energy cosumption vs. modern energy star class appliances, are all available.

VALUE PROPOSITION.

Online and historical access to energy usage data.

- Energy usage benchmarking.
- Energy usage optimisation.
- Energy alerts and alarms.
- Access to shops with star energy devices and proffesionals i.e electricians, heaters etc.
- Smart home devices integration.

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THE TEAM

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Operations leader

14 years of manufacturing, lean and consulting experience. Business turnarounds in Europe and South East Asia (Toyota).

Lukasz Kiełtyka
Hardware leader

15 years experience in electronic designing for Philips, Fiedeltronik, ABB.

Mariusz Adamczyk
Software leader

5 years experience in software developing in companies like Eurosoft, Comarch, Sabre.

MARKET SEGMENTS

- Municipality / District

B139 · **Match Rider** · *Germany*

Easy and reliable carpooling for daily commutes or spontaneous rides

Short distance carpooling is made convenient and attractive for drivers and passengers. Match Rider's approach to ride sharing feels a lot like public transportation; yet the company's offer is unique in that it: 1) focuses on specific, high traffic commuter routes 2) finds reliable drivers at reliable times for a reoccurring schedule 3) pays the drivers a guaranteed rate of around 10 cents a kilometer and 4) charges passengers approximately 15 cents per kilometer, often a rate that is significantly below the cost of public transportation.

THE NEED.

Drivers have little incentive to share their commutes as they expect such a low return on a single trip; they often feel inconvenienced and that they can't spare the time. This lack of supply causes potential passengers to ignore ride-sharing options in favor of more reliable ones, often, private automobiles.

THE SOLUTION.

Match Rider fills a market need in short distance carpooling by lowering the cost/benefit ratio. This gain is reflected in a guaranteed payment the driver receives for sharing their ride, while for the passenger it is an inexpensive, reliable and convenient mode of transportation to and from work.

VALUE PROPOSITION.

Fixed meeting locations along a driver's route, called Match Points, work similar to bus stops to help drivers avoid detours. Match Rider is different in that it:

- Focuses on specific, high traffic commuter routes.
- Finds reliable drivers at reliable times for a reoccurring schedule.
- Pays the drivers a guaranteed rate for the ride offered and
- Charges the passengers a price at or below the cost of other transportation options.

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THE TEAM

Alfred Swartzbaugh
CEO and System Architect
MBA IT University of Illinois (USA), responsible for the product including the website, API, and mobile apps. He has over 20 years experience developing logistical web and desktop software.

Benedikt Krams
Partner Management
M.Sc. Information Systems, University of Hohenheim (Germany), a PhD student at the University of Stuttgart. The last 6 years he has led the research cluster sustainable mobility at the University of Stuttgart.

Katina Schneider
Business Developer and Marketing
B.Sc. Communication, Arts, Sciences, Michigan State University (USA), responsible for operations, marketing strategy, and customer acquisition. She has 7 years sales and marketing experience.

Frank Anders
Business Developer and Finances
Economics, University of Heidelberg (Germany), Business Developer responsible for finances and product innovation. He has 10 years of experience in finance, project management and GIS Technologies.

CUSTOMER REFERENCES

Daiichi-Sankyo GmbH, The Ride Board, The City of Heidelberg, EcoLibro GmbH

B140 · **Wohnwagon** · *Austria*

Inspiring solutions for independent and sustainable living

Wohnwagon has been developed as a flagship project that offers completely self-sustained living, with its own water filtration system, energy production and heating. The goal is to inspire new and innovative solutions for living: self-sustained, sustainable and reduced to the max. The venture does not only sell Wohnwagons, but also the separate autarky systems on a web-platform and offers planning and consulting.

THE NEED.

The way we live and the way our homes are built have a massive impact on our climate. While most people are aware that we use excessive resources and build too big, they lack inspiring, tangible and doable alternatives.

THE SOLUTION.

The venture aims to change that, offering inspirational projects that show not only how awesome but also how easy it is to live in a more sustainable way. Furthermore, via a 'webplattform' the venture offers the know-how, products and tools required to implement such ideas and bring them to life.

VALUE PROPOSITION.

The Wohnwagon is the first fully self-sustained living unit. It has a closed water circulation system, energy production plus storage, heating and a bio-toilet. Wohnwagon is not only a product it is a concept for a way of living - as a lifestyle choice and a tool for change. The venture's website actively sells solutions for this way of life. While there are companies that sell solar- or water- treatment systems, no other can deliver a similar fully integrated solution as is encapsulated in self-sufficient housing.

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THE TEAM

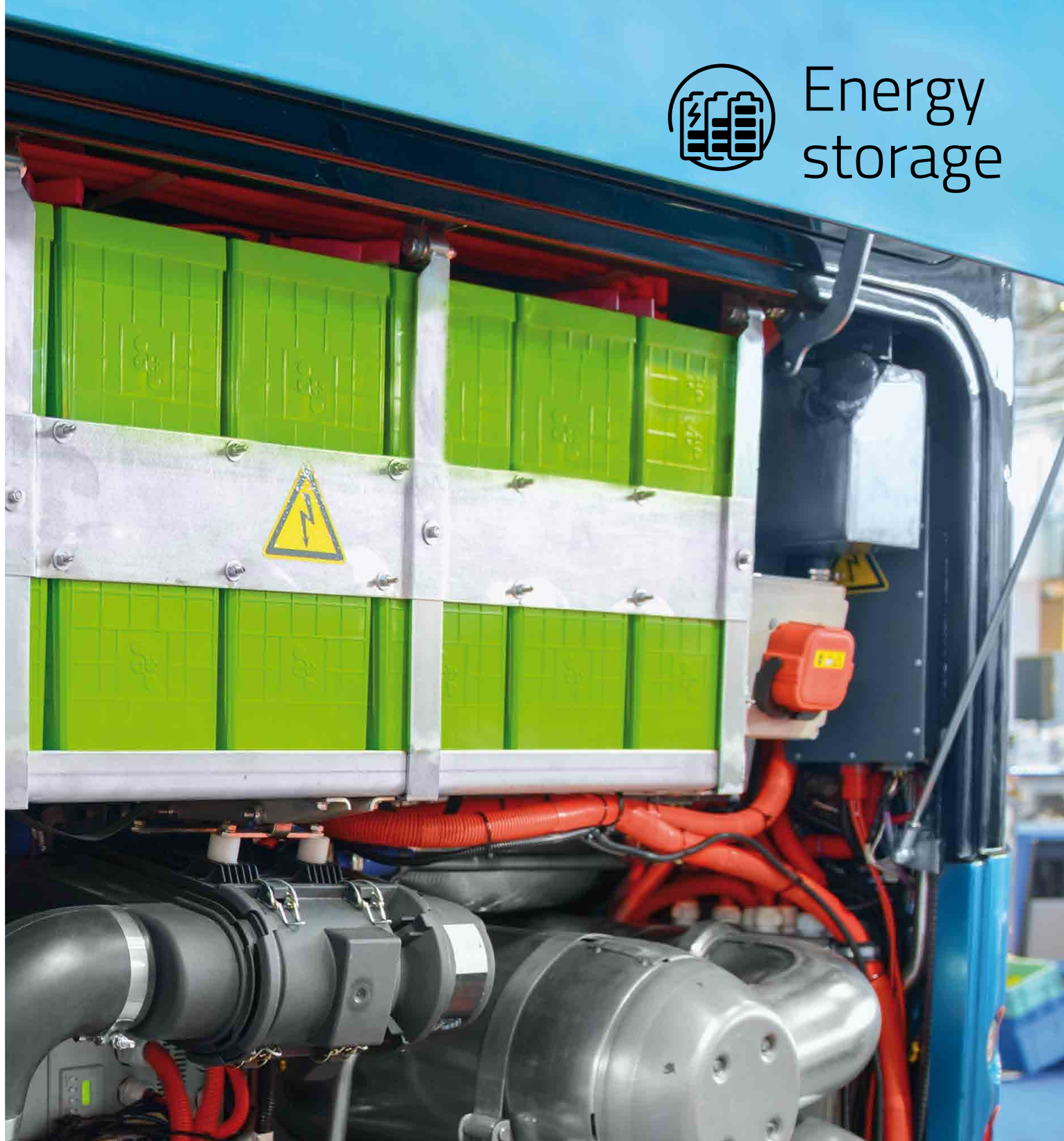
Theresa Steininger
CEO & Co-Founder
Master of Arts in Business, founded her first company at the age of 21 (agency for communication and design), background in marketing, project management and communication.

Christian Frantal
Planning and Innovation
Founder of "Pimp my Home" (craft enterprise, background in planning & project development), more than 20 years entrepreneurial experience.

MARKET SEGMENTS

- Off grid

Energy storage



B123 · **Atawey** · *France*

Develops, manufactures and commercialises renewable energy storage systems based on hydrogen technologies

Atawey proposes to make renewable energy usable in any season, at any time of day and in any isolated site in the world. This overcomes the problem of a loss of stored energy at times when there is no sunlight or wind available. The Atawey system can store the entire amount of renewable energy produced in high-capacity and long-term storage units based on hydrogen technologies.

THE NEED. On a site equipped with battery-run renewable energy receivers (solar panels, wind-power…) that is isolated from the electrical grid (on mountains, islands, extended territories, protected natural zones), more than 50% of annual energy production can be wasted owing to the rapid saturation of batteries. While one solution is to use genset power generators, this provokes issues of fuel oil supply, noise and atmospheric disturbance.

THE SOLUTION. Atawey's product is a turnkey package comprising a (daily) short-term storage system based on batteries, and a (annual) long-term storage system based on a complete hydrogen chain. The ATAWEY system converts excess renewable power into hydrogen and stores it for months. The hydrogen can then be converted back into power upon demand. The whole unit is integrated in a closed and sealed metal envelope, which allows it to be installed easily outdoors, even in hostile environments.

VALUE PROPOSITION.

- Simplicity: works without any fuel supply; energy reserves that are secure and available at any time; a system that is flexible over time; liberty of choice of use, and less demanding maintenance.
- Reliability: longer battery lifespan (20%), higher yield (50%), very large functional availability, reinforced protection to prevent vandalism.
- Cleanliness: use of eco-responsible components, non-polluting inputs and outputs (oxygen, water, heat), absence of atmospheric waste (CO_2, smoke, particles) and noise.

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THE TEAM

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15 years of experience as Maintenance, Industrialisation and Production Director working in the the food, pharmacy and cosmetics industriesies as Maintenance, Industrialization and Production Director.

Pierre-Jean Bonnefond
Engineer

17 years of experience as Project and Technical Manager working in industry as Project and Technical Manager.

MARKET SEGMENTS

- Off grid

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THE TEAM

André Mão de Ferro
Executive Manager

André Mão de Ferro has developed his professional career in fundamental and applied R&D in the area of chemical engineering for 3 years.

Rui Silva
Executive Manager

Rui Silva has developed his career in the car manufacturing industry for 2 years, and in applied R&D in the energy sector where he had the opportunity to work on the development of the technology behind C2C-NewCap.

B124 · **Charge2Change** · *Portugal*

Hybrid supercapacitors for high-efficiency energy storage

C2C-NewCap brings a new hybrid supercapacitor to the energy storage and energy conversion market. This new device is assembled in a hybrid configuration, having a highly capacitive electrode paired with an electrostatic one. The product is an energy storage device that operates safely and highly efficiently in tough environments. The unitary cell of this product can be fabricated in different shapes and sizes, and also combined with other cells to fit the myriad of applications in demand.

THE NEED.
The market for energy storage craves devices with higher efficiency, higher power and energy density that have a longer lifespan, can operate safely and at a lower cost. These are the most important variables of competitiveness among all the energy storage devices on offer, and these are the variables that need to be taken into account to beat the competition, in both serving market needs and providing more possibilities to that market.

THE SOLUTION.
C2C-NewCap has developed a product highly competitive in price, fabricated by a simple process and by non-expensive materials it also offers a higher power density, longer life cycle and safety operations when compared to batteries. This innovative product can operate together with battery systems or, in some cases, can replace them completely.

VALUE PROPOSITION.
Benefits to the customer include safety to the overall operation, higher energy efficiency and improved lifespan, all of which translate into lower operational costs.

B125 · **E-Sims** · *France*

Decision-making, supervision and management software services that empower the storage of renewable energy

MUST PLAN® is a collaborative decision SaaS (software as a service) that helps electricity decision-makers plan the investments on mutualised storage systems to meet the aims of distributed solar in the electricity mix of their areas. ALOE® is a supervision and management software that allows SPS (solar plus storage) producers to optimise the benefits of their power plants in real time, and according to technical and economic guidance. ALOE® is compatible with a wide range of storage systems thereby saving months of implementation.

THE NEED. Electricity is among the most expensive in the world on islands in particular. While the cost of solar energy and storage continue to lower, there still remain the following critical needs: Planning new business models is genuinely complex for decision makers. Managing combined technologies on the grid modifies local producers' core businesses.

THE SOLUTION. E-Sims offers two dedicated software services: MUST PLAN® provides a collaborative, secure, easy-to-use simulation and optimisation environment for decision makers. ALOE® provides a complete, scalable, easy-to-use SPS (solar plus storage) real time management environment for local producers.

VALUE PROPOSITION. MUST PLAN® is the first collaborative planning software as a service designed for island decision makers. In Martinique, it reduces the need of storage by 30%. ALOE® is a genuine solar plus storage management software allowing a local solar producer to transition instantly to SPS, while increasing revenue by up to 40%.

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THE TEAM

Kelli MAMADOU
CEO and founder

PhD from Grenoble University (2010), Research Master Degree from University Montpellier II (2006), and graduated from Centrale Marseille School as a Systems Engineer (2005) with fields of study: Electrical Engineering, Automatism and Signal Processing. 10 years work experience in grid connected electricity storage management, including 4 years as a project manager at the French National Institute of Solar Energy (CEA-INES). E-SIMS is growing constantly, the up-to-date team members list is available on our website.

MARKET SEGMENTS

- Smart grid
- Energy storage planification
- Energy storage real-time management

B126 · **Eco-Tech Ceram** · *France*

Thermal energy storage solutions using refractory ceramics produced from inorganic industrial waste

Eco-Tech Ceram develops new eco-efficient, transportable and modular thermal storage solutions. Inorganic secondary raw materials (e.g. industrial waste, such as coal fly ashes) is transformed into refractory ceramics, thus offering a low cost storage material that advantageously targets the "below 1000°C temperatures" heat storage recycling market. The company proposes commercialising the whole value chain, from material recovery to storage installations, including unit storage manufacturing.

THE NEED. The competitiveness and environmental impact of industries could be improved by reusing the large quantities of wasted energy (fatal heat). Renewables also require performant energy storage solutions (intermittent resources). The need for new thermal storage is huge. ETC provides a scalable and eco-efficient solution.

THE SOLUTION. The Ecostock thermal storage unit is modular, plug and play, eco-efficient, and low maintenance.
Target applications:
- Wasted heat (200°C to 1000°C) from heavy industries such as glass, steel, foundry, etc.
- Overproduction storage from renewable energies.

VALUE PROPOSITION. Below 1000°C, there is currently no economically viable solution. By reusing industrial waste to produce storage material, the Ecostock unit is adapted to waste heat recovery and renewable energy units. It is also inexpensive, plug-and-play, modular, and can promote the development of a circular economy.

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THE TEAM

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Deputy Managing Director

Graduated Engineer (ENSAM)
More than 30 years experience in international business development, sales and marketing management.

MARKET SEGMENTS

- Industry

B127 · **Ecovat** · *Netherlands*

Thermal storage of renewable energy and its integration in a hybrid microgrid

The Ecovat is an underground storage vessel with an integrated heat exchange system. This system is designed to be integrated in a hybrid smart microgrid and consists of power-to-heat appliances (e.g. heat pumps, electric heaters and cooled photovoltaics), storage (both thermal and electric) and a smart control system enabling power system balancing by storing surplus energy for use in case of energy shortages.

THE NEED.

Renewable energy is not always available when needed and, just as often, when energy is available, the quantities produced amount to more than is required at that specific time: storage is the missing link.

THE SOLUTION.

Ecovat is a thermal, seasonal storage system that enables heat storage of up to 90°C with minimal energy and exergy loss. Over a period of >6 months less than 10% of energy is lost, exergy losses are less than 7%. Ecovat's storage system is designed for integration in a hybrid smart micro grid.

VALUE PROPOSITION.

- Ecovat is the first storage system that can store heat up to 90°C and retrieve the energy after a long period (>6 months) with less than 10% loss.
- The construction costs of an Ecovat system are substantially lower than comparable systems (which are also less efficient).
- The steering system of Ecovat enables power system balancing and flexible utilisation of the energy markets.

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Ruud van den Bosch
Technical Commercial Officer

Rik Fonteijn
Officer Integration Electricity Markets

Tariq Ahmed Abul Kalam Azad
Engineer Computional Fluid Mechanics

MARKET SEGMENTS

- Municipality / District
- District heating grid

B128 · **Elestor** · *Netherlands*

Revolutionary low-cost electricity storage in a hydrogen-bromine flow battery

Elestor has developed flow batteries with an extensive lifespan that store electricity safely and at a fraction of the cost of traditional batteries. The low-cost active materials hydrogen and bromine, combined with a patented and simplified system design, have resulted in a storage system that operates at an unrivalled cost level per kWh stored.

THE NEED.

Given the unpredictability of the sun and wind, finding a cost-effective means of storing electricity is essential in order to make the world 100% sustainable.

THE SOLUTION.

The Elestor electricity storage systems are based on hydrogen-bromine flow battery technology. Originally developed in 1961 by NASA, Elestor has matured this technology to enable its use in a wide variety of industrial applications. In comparison to traditional storage technologies, the key to its success is the ability to store electricity in an extremely cost-effective way.

VALUE PROPOSITION.

Storage costs per kWh 5-10 times lower than incumbent systems.

- Modularly scalable, from 50 kW up to several MW.
- Independent configuration of storage power (kW) and capacity (kWh).
- No self-discharge when system idle.
- Fast reaction kinetics, resulting in very short response times.
- High accessibility, enabling easy maintenance and upgrades.
- High depth of discharge.
- System lifetime not subject to (dis)charge power.
- Ultra-high power density.

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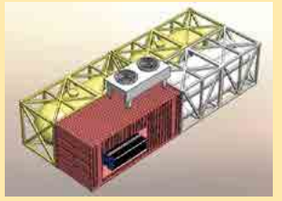

THE TEAM

Wiebrand Kout
Founder & CTO

15+ years experience in developing innovative electrochemical systems. Began at NedStack Fuel Cell Technology heading the mechanical design of Europe's first series-produced PEM fuel cell. Later served as COO of HyET co-developing the first electrochemical hydrogen compressor that reaches 1,000 Bar.

Guido Dalessi
CEO

Graduate in Physics. 10 years in R&D of laser technology. In 1996, managed the market introduction of a start-up that developed high-tech production systems. He was made CEO in 2004 when Singulus Technologies AG acquired this company, which went on to become a world leader.

MARKET SEGMENTS

- Tertiary (non-residential) building
- Industry
- Onshore wind

CUSTOMER REFERENCES

Witteveen+Bos, PGE

B129 · **Flowbox** · *France*

Commercialised by Areva

Novel low cost energy storage solution for renewable integration

THE NEED.

Energy storage fits all technical challenges of the energy transition, but it has to become a cost competitive solution to have a chance to play a significant role in the energy system. The main key success factor of the energy storage market relies on the competitiveness of energy storage solutions.

The customers' needs are:

- Utilities - Renewable integration combined with reduction in capital expenditure on transmission and distribution.
- Industrial users - Management of energy costs by reducing grid consumption during peak hours.
- Micro grid operators / off-grid sites - Reduction of cost through the integration of renewables.

THE SOLUTION.

The objective of this Flowbox project is to evaluate a new "Flow battery" technology type based on the H2/HBr redox couple and to prove its ability to reach the market target. The validation is focused on the technical feasibility (both power scale up and safety) as well as the economic feasibility to reach a 250€/kWh CAPEX. The H2/HBr system is geared towards energy applications through a cost effective energy storage solution that can support the grid for a long number of hours (above 5h). The solution contributes to:

- Support the integration of renewable energy sources into the grid by overcoming their intermittency.
- Reduce the need to invest in additional infrastructures.
- Manage peak demand.

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THE TEAM

Lucile VOIRON
Project manager

MARKET SEGMENTS

- Industry
- Solar PV
- Power DSO

B130 · **HIphone** · *France*

Commercialised by Raigi

A high-pressure hydrogen tank for the automotive market in accordance with the requirements of car manufacturers

T.+ 33 (0)2 37 33 30 40

perrier.olivier@raigi.com

THE NEED.

A number of leading car manufactures have announced an extension of the hydrogen fuel cell vehicle (HFCV) and have signed up to the Hyfive3 project, making hydrogen fuel cells a viable alternative. Some car manufacturers, however, are not yet engaged in industrial development and are looking for hydrogen tank solutions.

THE SOLUTION.

The HIphone project has developed a European high-pressure hydrogen tank for the automotive market in accordance with the specific requirements of car manufacturers and EC79/2009 regulation

VALUE PROPOSITION.

A new tank to store hydrogen. Hydrogen offers a wide range of advantages as a power supply for electrical vehicles.

The HIphone project is a great improvement in comparison with batteries, as:

- Autonomy is significantly increased up to 500 km.
- Refuelling takes just a few minutes.
- The hydrogen network remains the same as the one currently used for petrol.

Raigi provides a specific tank solution with over-molded connections that offer a high quality level. The venture has specific patents and know-how regarding the process. A tank is in process and set to be homologated for beginning production in 2017.

MARKET SEGMENTS

- Smart energy efficient mobility

B131 · **HySiLabs** · *France*

Hydrogen based fuel

HySiLabs has developed a process that releases hydrogen on demand with no energy input, from a stable liquid fuel, while generating no emissions. Our technology maintains the advantages of an energy-dense hydrogen vector without any storage or transportation issues.

THE NEED.

The world's energy needs are rising, and we are highly dependent on fossil fuels to meet those energy demands. However, fossil fuels release emissions that are harmful to the environment and to our health. A solution to this problem is energy from hydrogen, which is emission-free. However, with current technology, hydrogen is still expensive to produce and difficult to transport and store as a gas.

THE SOLUTION.

HySiLabs is proposing a hydrogen-based fuel which produces hydrogen on demand, with no energy input, while generating no emissions. The fuel is a stable, non-toxic, non-flammable liquid that is easily accessible and easy to handle. This unique technology maintains the advantages of an energy-dense hydrogen vector while simplifying production and removing storage and transportation issues. Our solution can be used for a wide range of applications from power generation to hydrogen refueling stations.

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THE TEAM

Pierre-Emmanuel Casanova
CEO

Dual Master's degree in sustainable development and Innovation Management, Business developer/ Marketing strategic engineer at Cisbio and I-stem.

Vincent Lôme
CSO

PhD in Biotechnologies. Specialist robotization and automatisation at Bacsreen platform

MARKET SEGMENTS

- Off grid
- Biogenic & Synthetic liquid fuels
- Smart energy efficient mobility

CUSTOMER REFERENCES

Icade, Carrefour, Technopole de l'environnement de l'arbois

B132 · **Infinite Fuels** · *Germany*

Converts biomass into high value hydrocarbons

Infinite Fuels is developing a technology for the regenerative production of hydrocarbons, which are chemically identical to those of mineral oil. After scaling up the Infinite Fuels process combination to the size of industrial production, Infinite Fuels is planning to build and operate such facilities. By using its unique process combination, the company plan to establish sustainable raw material cycles in various industries worldwide.

THE NEED.

There is not enough energy storage for the growing number of fluctuating renewable energy sources. No other technology can deliver bio-based fuels in such an efficient way and in substantial quantities. Beside the fuels, there is also an increasing demand of bio-based chemicals and raw materials that were formerly derived from petroleum.

THE SOLUTION.

We combine biomass or bio-waste with electricity to produce hydrocarbons such as industrial gases, solvents and liquid fuels in the boiling range of gasoline, kerosene or diesel. And also for the conversion of fluctuating wind and solar power (1000 - 2200 full load hours per year) into stable base load power, with 8000 full load hours per year.

VALUE PROPOSITION.

Infinite Fuels technology has been tested by an independent institute with the following results:
Turnover rate > 98%, material yields > 87.5%, current efficiency > 84% and selectivity > 89%
The mild reaction conditions simplify plant construction and approval procedures. More organic raw materials can be processed compared with competing technologies. The wide range of products with separate marketing opportunities gives a very good control over economic plant operation.

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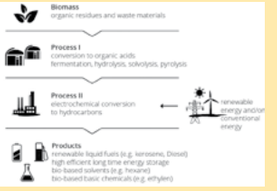

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CEO

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Engineer / VP Technology

Andreas Noky
Engineer / VP Operations & Market Analysis

Christian Lohaus
Engineer / Pilotplant operations

MARKET SEGMENTS

- Biogenic & Synthetic liquid and gaseous fuels
- Energy storage solutions for the grid

CUSTOMER REFERENCES

University of Applied Science

B133 · **Lancey**· *France*

A space heater with a connected battery designed for smart building energy management

Lancey Energy Storage has developed a plug and play space heater, integrating a lithium battery. The patented architecture saves up to 50% on energy bills, storing electricity when it's cheap and consuming it when the user needs it most. Easy to install, compatible with demand-response policies and fully controllable via a specific app, the space heater, by Lancey Energy Storage, is the smartest way to store energy, offering significant energy savings.

THE NEED.

More than 150 million first generation space heaters are still used worldwide, despite their being subject to significant energy loss and electricity grid constraints. The electric heating system is expensive to upgrade, particularly when using gas; a new system and new fluid network can amount to some 20k€ extra cost.

THE SOLUTION.

The space heater developed by Lancey Energy Storage is plug and play, and its installation is 75% less expensive than a gas heating system. Customer-friendly, the elegantly designed heater with an integrated battery can save up to 50% on energy bills.

VALUE PROPOSITION.

Lancey Energy Storage has developed a patented device for building owners, enabling them to upgrade their energy facilities at a limited cost but with high value for customers. With its integrated battery and sensors, Lancey's connected space heater allows building proprietors to receive value from demand-response policies, while also monitoring and controlling energy usage in their buildings with an increased degree of precision.

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CEO

Moreau Gilles
CTO

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Product development

Ory Hervé
CFO

MARKET SEGMENTS

- Heating & Cooling
- Residential building
- Tertiary (non-residential) building

CUSTOMER REFERENCES

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Ph.D., D.Sc., CEO

Associate Professor at the Faculty of Chemistry, Jagiellonian University, specialist in chemistry and technology of materials and nanotechnology for energy storage applications, co-author of 110 publications and 8 patents.

Joanna Świder
MSc, Member of the Board

PhD student at the Faculty of Chemistry, Jagiellonian University, specialist in chemistry and materials science.

MARKET SEGMENTS

- Smart energy efficient mobility
- Energy storage solutions for the grid

CUSTOMER REFERENCES

Jagiellonian University , AGH University of Science and Technology

B134 · **MarCelLi** · *Poland*

The better battery

MarCelLi Adv Tech activities focus on the research and development of advanced technologies for energy storage applications. The first product is an innovative technology of manufacturing CCL/nano-LiFePO4 nanocomposite cathode material for Li-ion batteries. Premium class Li-ion batteries with cathode materials manufactured accordingly to our technology are characterised not only by higher capacity and improved operational and environmental safety but also by increased durability which leads to longer product life.

THE NEED.

Current Li-ion batteries can be inefficient when used for more demanding applications, such as xEV and ESS market segments for renewable energy solutions and smart grids. The market requires higher performance, cheaper, safer and more environmentally-friendly solutions to meet a growing demand.

THE SOLUTION.

The developed technology concerns a high performance CCL/nano-LFP nanocomposite cathode materials with improved capacity and power density, improved chemical stability, durability and security and with a reduced environmental impact.

VALUE PROPOSITION.

- High power, improved capacity and power density.
- Lower costs, by using environmentally-friendly materials and processes.
- Safety, improved chemical stability, durability and security.
- Long cycle life, improved cyclability up to 2000 cycles with minimal performance degradation.
- Lower costs, by using environmentally-friendly materials and processes.

B135 · **NawaTechnologies** · *France*

Ultra-fast batteries

NAWATechnologies is developing an ultra-fast, long life green battery to complement and/or replace batteries in applications where dynamic electricity storage is privileged. We have developed and are industrialising a new material with outstanding properties that allows for the design of electricity storage systems with 3 to 5 times more energy than existing products.

THE NEED.
Today's batteries are reaching their limits in terms of life cycle, security and environmental impact. The need for cleaner, safer, reliable and longer life storage systems is critical in applications where one wishes to privilege usage, (speedy recharging), over autonomy.

THE SOLUTION.
Our cells, modules and systems will help increase uninterrupted power supply reliability in data centres, making renewables short-term production more predictive and lowering the cost for short distance transportation electrical vehicles, such as e-buses, e-ferries and trams, as well as for any future connected mobile usage.

VALUE PROPOSITION.
Our value proposition comes from two breakthroughs (i) first in the material itself and the way it can be produced on a mass level at low cost, and (ii) as a consequence, the performance and cost of our ultra-fast storage system, equivalent in terms of energy density to a lead acid battery but with all the advantages of an ultracapacitor, and compatible with a cost objective desirable in today's market (250-1000€ by W·h).

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THE TEAM

Dr. Pascal BOULANGER
Co-founder and CEO.
Pascal has been researcher for 20 years in several energy domains and nanotechnologies and technology transfers.

Dr. Ludovic EVEILLARD
Co-founder and VP Sales and Marketing for NAWATechnologies
Ludovic has occupied many positions in small as well as large companies dedicated to business development and marketing.

MARKET SEGMENTS
- Tertiary (non-residential) building
- Smart energy efficient mobility

B136 · **Sylfen** · *France*

Integrated energy storage and production solutions for buildings and eco-districts that wish to secure energy supplies with local and renewable sources

nicolas.bardi@sylfen.com
www.sylfen.com

THE TEAM

Nicolas Bardi
President and co-founder of the company
20 years experience in the energy sector fulfilling strategic functions, including team and programme management.

Caroline Rozain
Product innovation and co-founder of the company
An expert in electrochemistry: electrolysis engineering doctorate, batteries.

Marc Potron
Operations manager
30 years experience in the industry and in engineering. Systems architect and management of highly demanding projects. Business unit management.

MARKET SEGMENTS
- Municipality / District
- Residential building
- Tertiary (non-residential) building

CUSTOMER REFERENCES
CEA, Air Liquide, Engie, IDEX

Sylfen offers the Smart Energy Hub, a solution that combines batteries, for their fast switching capabilities, with an innovation: a reversible electrolyser, capable of storing energy in the form of hydrogen and rendering it, when needed, in the form of heat and electricity. Thanks to its software (modelling of building and the Smart Energy Hub) as well as to the adaptability of its product, Sylfen can render any zero energy building autonomous in terms of energy consumption.

THE NEED. Although capable of using buildings to produce energy, there are still uncertainties regarding the security of the total energy supply required. Batteries alone cannot provide sufficient autonomy and an additional technological solution is needed.

THE SOLUTION. Sylfen combines batteries with a reversible technology, acting firstly as an electrolyser to store energy in the form of hydrogen, and secondly as a fuel cell to produce heat and electricity from stored hydrogen or from biogas.

VALUE PROPOSITION. Sylfen offers an optimum combination in associating batteries and a breakthrough technology: the reversible electrolyser. This innovation is protected by 22 patents and allows for a compact hydrogen chain with low costs and high efficiency. Moreover, Sylfen's development is oriented to serve the construction market with a highly modular product that is, thanks to its modelling tools, fully integrated, as well as optimised to each configuration.

B137 · **Wattsun pop-up power** · *Netherlands*

Wattsun provides green pop-up power for off-the-grid situations

Wattsun is developing a unique mobile power supply, which makes renewable energy available in outdoor and off-the-grid situations. This means an alternative for classic fossil fuel powered generators. Wattsun's user-friendly modular system delivers power with the touch of a button.

THE NEED.

In off-the-grid situations it is common to use fuel generators as a power supply. These generators typically have low energy efficiency, emit vast amounts of CO2 smell and noise and they come with a lot of handling costs for installation and maintenance. The most obvious need for energy at events are sound and lighting equipment, but there are also a lot of standalone situations such as first-aid and promo booths, cash and ticket registers, communication and Wi-Fi spots. On a second plan, an extra power supply can support last-minute changes, and provide energy in extraordinary locations. Besides that there is a fast growing request for the use of sustainable energy at events.

THE SOLUTION.

Wattsun provides a robust, easy to use and sustainable off-grid power supply called Pop-up Power, that can be charged with renewable energy. This means no emissions(CO2, NOx, smell or noise).

VALUE PROPOSITION.

- Pop-up Power
- Mobile and flexible capacity
- Cost-effective compared to 'traditional solutions' like generators
- User-friendly

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THE TEAM

Paul Schurink
Founder and CTO
Master in Business in Energy Systems.

Koen Olieslagers
Founder and CEO
Bachelor of Engineering.

Lucas Bergma
Developer
Bachelor of Engineering.

Bart Hendriks
Marketing & Sales
Bachelor of Commerce.

MARKET SEGMENTS

- Off grid

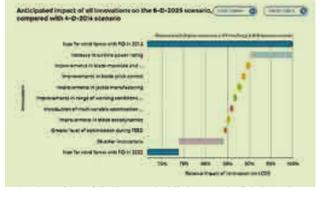
"The Business Booster facilitates my job, I get to meet over 100 innovative solutions at a single place. It is a perfect use of my time"

Valery Prunier, *Innovation Director Europe & Middle East* EDF R&D

InnoEnergy products

Delphos. Tracking the impact of innovation on the levelised cost of energy

For years, large organisations have used their own in-house predictive models to enhance the visibility of the impact their technology has on the LCOE. This has enabled them to clearly demonstrate return on investment, attract funding, prioritise research and development efforts and, in the case of policymakers, provide a means of understanding the required role and reach of future incentives. However, more often than not, such tools are out of reach to individuals, start-ups or smaller businesses and, consequentially, great ideas and inspirational approaches remain undiscovered.



THE NEED. Smaller companies need an accessible, collaborative approach to channel that expertise; one that makes it easier to identify which technologies they should prioritise for development, and one that consistently demonstrates the impact of an innovation on the LCOE, helping to attract investment and shape policy.
THE SOLUTION. InnoEnergy's cost evaluation platform, DELPHOS, is an online tool designed to make a series of cost models and basic datasets publicly available that improve the analysis of innovations' impact on cost. It additionally provides a reference that allows the research community, industry, policy makers and investors to make robust decisions regarding the role of innovation in the energy sector, as well as to feed their own company's strategy definition processes.
THE VALUE PROPOSITION. It enables exploration and tracking of the impact of innovations on the levelised cost of energy (LCOE). It makes it easier for companies innovating in on- and offshore wind, as well as in solar power, to better demonstrate a product's impact on the cost of energy. Possibility of editing existing datasets to any particular situations. On-line tool, available 24/7.

Developed in collaboration with

BVGassociates

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www.innoenergy.com/delphos

E2Talent. Assess the chances of start-up success

E2Talent® measures the entrepreneurial skills of individuals and team dynamics within a start-up, evaluating their potential of success and ultimately supporting the decision-making process for VC Companies and accelerators.

THE NEED.
A start-up's success – or failure – has a lot to do with its people. An entrepreneur's 'soft' skills play an equally important role as the technology or business strategy. Yet, the impact of entrepreneurship skills on the life of a new start-up is often underestimated, and because there are no tools on the market to assess these skills in a scientific way, more often than not, the team assessment is based on a mere gut feeling.

THE SOLUTION.
E2Talent® proposes a set of tools to measure skills such as performance expectations, adaptability, and capacity, through a series of surveys and simulations. Eighteen distinct key skill sets can be identified, all of which have been proven to predict the success of a start-up. In addition, E2Talent® enables you to assess key aspects of team dynamics which are crucial to the development of a start-up, such as the leadership dynamics within the team, how they solve problems, complementarity of skills and missing competencies within the team. The results can then be used to build a competency improvement plan.E2Talent® can also alert you about potentially incompatible team members or those who may struggle to be coached.

VALUE PROPOSITION.
Rigorous: E2Talent®is based on the research work of renowned entrepreneurship experts Richard Boyatzis, Robert Emmerling, and Joan Manuel Batista-Foguet. It was developed using a rigorous research protocol to identify the characteristics of successful entrepreneurs and pinpoint how they are different from those who are unsuccessful or not an entrepreneur at all.
Robust: E2Talent® measurements are taken using three different instruments: biographical and personality questionnaires; an online in-basket job simulation; and a structured interview. The data are then cross-validated for particularly robust results.
For individuals and teams

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InnoEnergy reports

Top 10 Energy Innovators in 100 Energy Priorities Report

Innovation in sustainable energy is key for the future of energy worldwide. According to the International Energy Agency, global energy demand is expected to grow by more than one-third by 2035. Where do we have to innovate to ensure sustainability? Who and where are the players driving innovation? Which energy priorities are transforming the future of the energy landscape? InnoEnergy´s global study answers exactly these questions, providing in-depth insights on the energy innovation landscape and the future game changers who will have the greatest impact on the market.

The Top 10 Energy Innovators in 100 Energy Priorities report is the first to identify and rank the top industry and academic players worldwide at the same time according to their innovation competencies in 100 energy priorities – defined in InnoEnergy´s Innovation Strategy for 2014-2019.
This report covers 8 thematic fields: Wind Energy, Ocean Energy, Solar Photovoltaic System, Solar Thermal Electricity, Smart Buildings and Cities, Smart Grids and Electric Storage, Renewable Energy Convergence, Clean Coal and Gas Technologies.

Global results. The global results show that 80% of innovative industry leaders come from Japan, USA and European regions, while China leads the list of academic innovative players. However, Chinese industrial players are almost absent from the rankings. The best positioned regions are Europe and the USA with a balanced presence of both industrial and academic players.

Methodology. The report has analysed close to 150,000 patents, 180,000 scientific publications, identified 1,890 R&D collaborations, 340 acquisitions and start-ups, 1,227 products, services and licenses and 2,000 industry and academic players, achieving strong and comprehensive conclusions. The players are ranked according to both qualitative and quantitative KPIs, such as measures of patents, scientific publications, strategic involvement in each topic, collaboration in R&D and R&D commercialisation.

Sources of information

- Professional databases: Orbit®, Thomson Innovation®, Web of Knowledge®, OneSource®.
- Public information: players' press releases, technology transfer offices' websites, financing institutions' websites (Cordis, enGrant Scientific), thematic fields' websites (news, associations), and players' annual reports.
- InnoEnergy survey: to partners and to 850 top industry and academic players worldwide.
- The report has analysed close to 150,000 patents, 180,000 scientific publications, identified 1,890 R&D collaborations, 340 acquisitions and start-ups, 1,227 products, services and licenses and 2,000 industry and academic players, achieving strong and comprehensive conclusions.
- The players are ranked according to both qualitative and quantitative KPIs, such as measures of patents, scientific publications, strategic involvement in each topic, collaboration in R&D and R&D commercialisation.

Offshore Wind Report

This report is an update of a previous report published by InnoEnergy in June 2014 and uses the same input data. The analysis has been expanded, extended and updated, including via fresh engagement with industry. The purpose of this report is to document the cost of energy for offshore wind projects reaching financial investment decision (FID) up to 2030, by modelling the impact of a range of technical innovations and other effects including financing and supply chain impacts. More than 50 technology innovations were identified as having the potential to cause a substantial reduction in LCOE through a change in the design of hardware, software or process. In this report, InnoEnergy extends the temporal horizon of the previous offshore wind study to 2030 and increases the turbine capacity to 10MW to look at longer-term trends in the innovation pathways. All these analyses contribute to the InnoEnergy DELPHOS online cost of energy tool.

Onshore Wind Report

This second report in the series examines how technology innovation is anticipated to reduce the cost of energy from European onshore wind farms over the next 12-15 years. For this report, input data is based partly on Future renewable energy costs: offshore wind, published in June 2014. For this report, the many offshore-specific innovations have been replaced by a series of onshore-specific innovations, and the impact of those relevant to both markets have been revised to ensure its applicability to the European onshore wind market. Fresh industry engagement supported this process.

Solar-Thermal Electricity Report

This third report examines how technology innovation is anticipated to reduce the Levelised Cost of Energy from European solar-thermal electricity (STE) plants over the next 12 to 15 years. For this STE report, input data is closely based on the InnoEnergy technology strategy and roadmap work stream published in October 2014. The output of that work was an exhaustive and comprehensive set of discrete innovations and groups of innovations together with their potential impact on known reference plants, built on expert vision and knowledge.

Solar-Photovoltaic Report

This fourth report examines how technology innovation is anticipated to reduce the Levelised Cost of Energy from European photovoltaic installations over the next 12 to 15 years. For this report, input data is closely based on the InnoEnergy technology strategy and roadmap work stream published in October 2014. The output of that work was an exhaustive and comprehensive set of discrete innovations and groups of innovations together with their potential impact on known reference plants, built on expert vision and knowledge.

Future Energy Costs: Coal and Gas Technologies Report

The purpose of "Future Energy Costs: Coal and Gas Technologies" report is to document the anticipated future cost of energy from two Technology Types – coal plants with upgrades and new gas combined heat and power (CHP) plants – reaching their financial investment decisions (FIDs) in 2020 and 2025, by reference to robust modelling of the impact of a range of technical innovations and Other Effects on baseline cases at the start of 2016. This work is based on methodologies established for InnoEnergy by BVG Associates (BVGA) over four previous projects covering onshore and offshore wind, solar photovoltaic and solar thermal energy generation. The focus is on the EU market and the report also outlines major energy policy trends in the EU.

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Open Innovation Village Partners

ENGIE
by people for people

PRINCIPLE POWER

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VEOLIA

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