

Horizon 2020 Plan

for increasing 20% efficiency in all European countries

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EBRD – Quartz Matrix

▶ Innovate and use technology

- To be competitive on world basis
- To reduce use of energy
- To solve problems
 - Climate change
 - Transport
 - Energy security
 - Food security
 - Health



Why Horizon 2020

Horizon 2020 Programme

- ▶ Strengthen the EU's position in science with a dedicated budget of **€ 24598 million**.
- ▶ **€ 17938 million**. This includes major investment in key technologies, greater access to capital and support for SMEs.
- ▶ Provide **€ 31748 million** to address major European concerns:
 - climate change
 - developing sustainable transport and mobility
 - making renewable energy more affordable
 - ensuring food safety and security
 - coping with the challenge of an ageing population.
- ▶ **Total~€79 Billion**
- ▶ <http://ec.europa.eu/programmes/horizon2020/h2020-sections>

A strategy for competitive, sustainable and secure energy

- ▶ Reduce greenhouse gas emissions by 20% by 2020
- ▶ To provide European citizens with the widest energy source choice
- ▶ Member States to decide on their own energy mix
- ▶ Several energy and ICT technologies need to be available.
- ▶ The objective of a further reduction up to **80–95% by 2050**
- ▶ Nuclear – very serious programme not covered here



Horizon 2020 – R&R – Secure, Clean and Efficient Energy

- ▶ Support the transition to a reliable, sustainable and competitive energy system.
- ▶ Overcome a number of challenges, such as:
 - increasingly scarce resources
 - growing energy needs
 - climate change.
- ▶ The Energy Challenge is structured around seven specific objectives and research areas:
 - ▶ 1. Reducing energy consumption and carbon footprint (CHP, PV, ICT, New motors, improved control systems, Inverter drives, Power factor management, planned maintenance/reliability increases)
 - ▶ 2. Low-cost, low-carbon electricity supply
 - ▶ 3. Alternative fuels and mobile energy sources
 - ▶ 4. Alternative fuels and mobile energy sources
 - ▶ 5. New knowledge and technologies
 - ▶ 6. Robust decision making and public engagement
 - ▶ 7. Market uptake of energy and ICT innovation.

Major funding for R&D and commercial development

A budget of €5 931 million has been allocated to this non-nuclear energy research



Four Main Focus areas

- ▶ **Energy efficiency** is a no-regret option for Europe.
- ▶ The EU has to decrease primary energy consumption by 2020 and 2050. Research and demonstration activities will focus on:
 - buildings, industry, heating and cooling, SMEs and energy-related products and services, integration of ICT and cooperation with the telecom sector.
- ▶ **Renewable energy: share of renewables rose to 14% of EU energy consumption in 2012**

1. Energy Efficiency

Secure, Clean and Efficient Energy

Low Carbon Technologies

- ▶ Bring to market affordable, cost-effective and resource-efficient technology solutions to give secure energy supply and complete the energy internal market.
- ▶ Research activities within this area will cover:
 - Photovoltaics, Concentrated Solar Power, Wind energy, Ocean Energy, Hydro Power, Geothermal Energy, Renewable Heating and Cooling, Energy Storage, Biofuels and Alternative Fuels, Carbon Capture and Storage.

2.Low Carbon Technologies

Secure, Clean and Efficient

Smart Cities & Communities

- ▶ Sustainable development of **urban areas** is a challenge
- ▶ It requires new, efficient, and user-friendly technologies and services, in particular in the areas of energy, transport and ICT
- ▶ These solutions need integrated approaches
 - Research and development of advanced technological solutions
 - Their **Deployment**
 - The focus on smart cities technologies will result in commercial-scale solutions with a high market potential.

3. Smart Cities & Communities

Secure, Clean and Efficient Energy



- ▶ SET – Formulation of the energy challenge under Horizon 2020 developed from revision of the Strategic Energy Technology Plan.
- ▶ Since 2008, it has been the centre–piece of the research and innovation policy in the field of energy. It is the reference point for European, national, regional and private investment.
- ▶ SET Plan needs reinforcing to respond to new challenges
- ▶ To better research and innovation across Europe.
 - The process began in May 2013 with development of an Integrated Roadmap for the SET Plan.
 - This defines priorities across the entire energy system through one consistent agenda at EU level from research to market uptake.

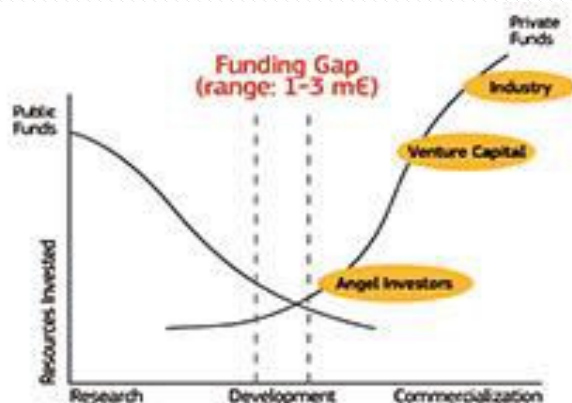
4. Policy driver

Secure, Clean and Efficient Energy



▶ SME R&D support for funding

- ▶ There are three phases. Phase 1 is the feasibility phase or 'proof of concept' phase, and involves such activities as market studies, intellectual property rights (IPR) studies, customer surveys, risk assessments, and feasibility and viability assessments. For this phase the support provided is a lump sum of EUR 50,000.
- ▶ Phase 2 is the innovation project phase or 'demonstration of commercial potential' via such activities as prototyping, testing, piloting, miniaturisation, scaling-up and application development. For this phase the SME Instrument will provide funding in the indicative range of EUR 0.5 million to EUR 2.5 million – **typically 70% of funding required by the SME. A consortium of SMEs and R&D organisations is required to bring skills not available – lead by the SME**
- ▶ Phase 3 is the commercialisation or 'go-to-market' phase. For this phase the SME Instrument will not provide direct funding but will support the SMEs through investor readiness activities, IPR support, networking activities, and awareness raising with respect to the financial instruments (both equity and loans).



SME Funding

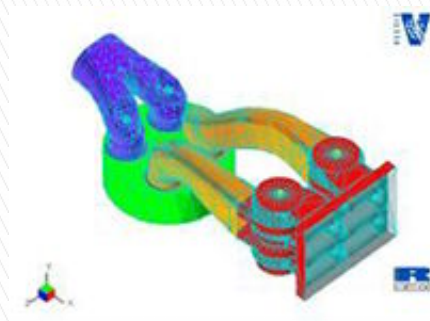
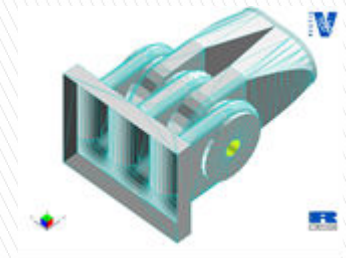
Build a team, gain European access to skills and markets

The Magmove Project (FP6-7)

Magnetic Movement Valve for Miller Cycle operation of engines
– reducing NO_x, CO₂ and particulate emission.

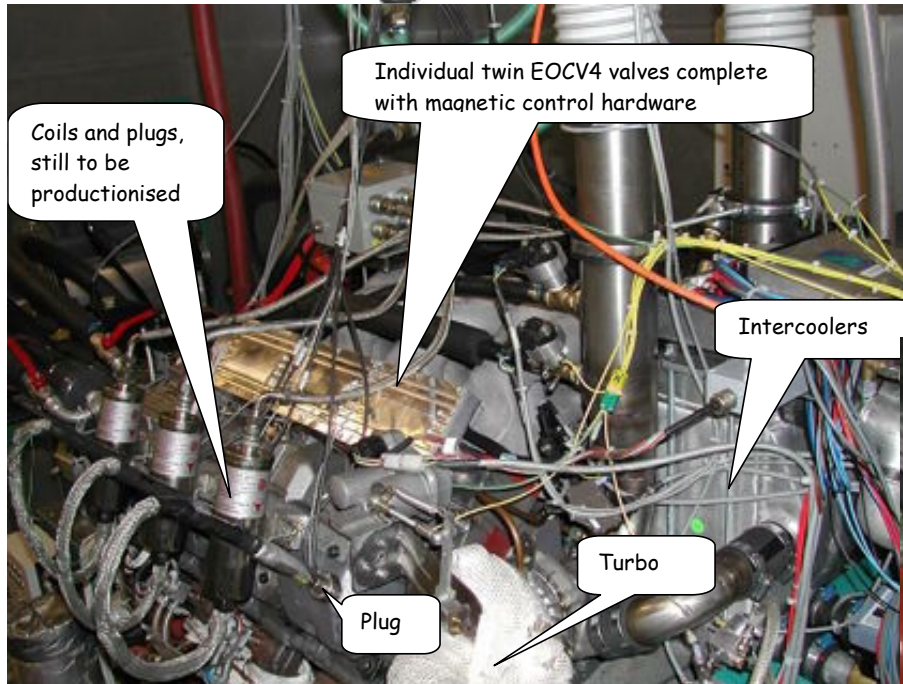


1. Nonox bv (NL) – Technical ideas technical and coordinator
2. Cardiff University (UK) – CFD/Modelling
3. University Aachen (D) – Metallurgy and wear characteristics/life assessment
4. Europus Ltd (UK) – Project Management/Administration

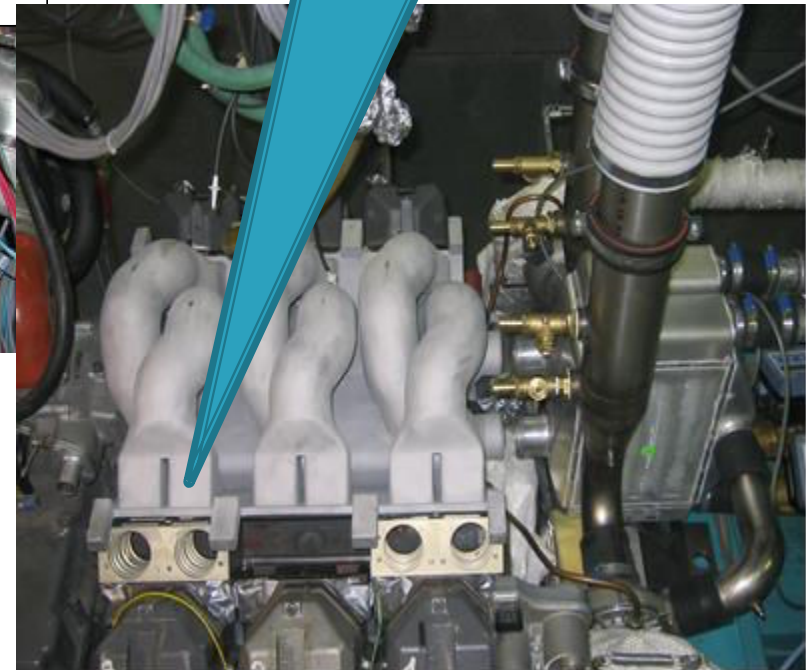


An SME Project –
typically 70% of funding

Completed new valves on operational V6 Diesel engine – running on CNG



CFD produced design implemented



Results:
Euro V Emissions
10⁹ cycles life
44% thermal efficiency
at full load

The Supported Energies

- ▶ Non-nuclear energy
 - Concentrated Solar and Photovoltaics (PV)
 - Wind,
 - Ocean,
 - Hydro
 - Geothermal
 - Bioenergy/AD
 - Fuel Cells/Hydrogen
 - Electricity Grids
 - Carbon Capture and Storage
 - Energy Storage
 - Energy Efficiency, Smart Cities and the integration of ICT in all energy fields.

·Romania
·36.4 % - [natural gas](#)
·25.1 % - [oil](#) and derivatives
·22.4 % - [coal](#) and [coke](#)
·16.1 % - [hydro](#) and others

- ▶ Nuclear energy (Fission and Fusion).
- ▶ Not discussed today



The Vidraru dam

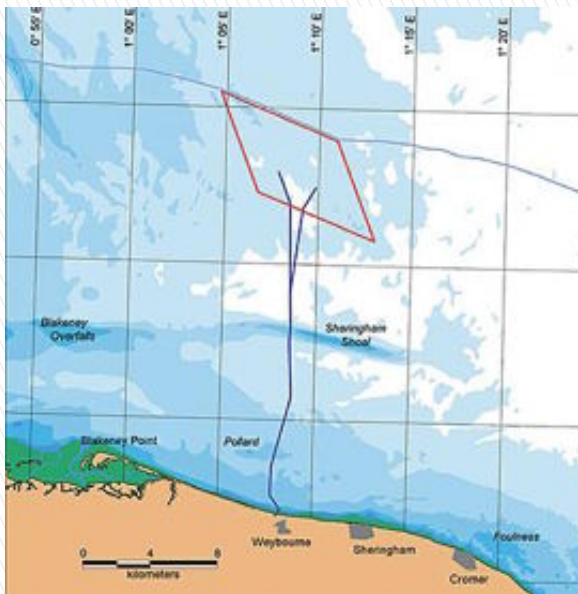
Wind



Category status	Total capacity
Commissioned	992 MW
Under construction	1009 MW
Approved	4110 MW
Proposed	385 MW
All Stages	6496 MW

Fântânele-Cogealac Wind Farm



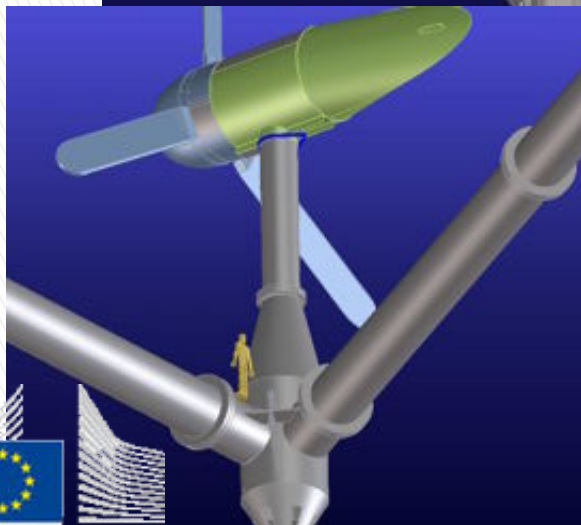
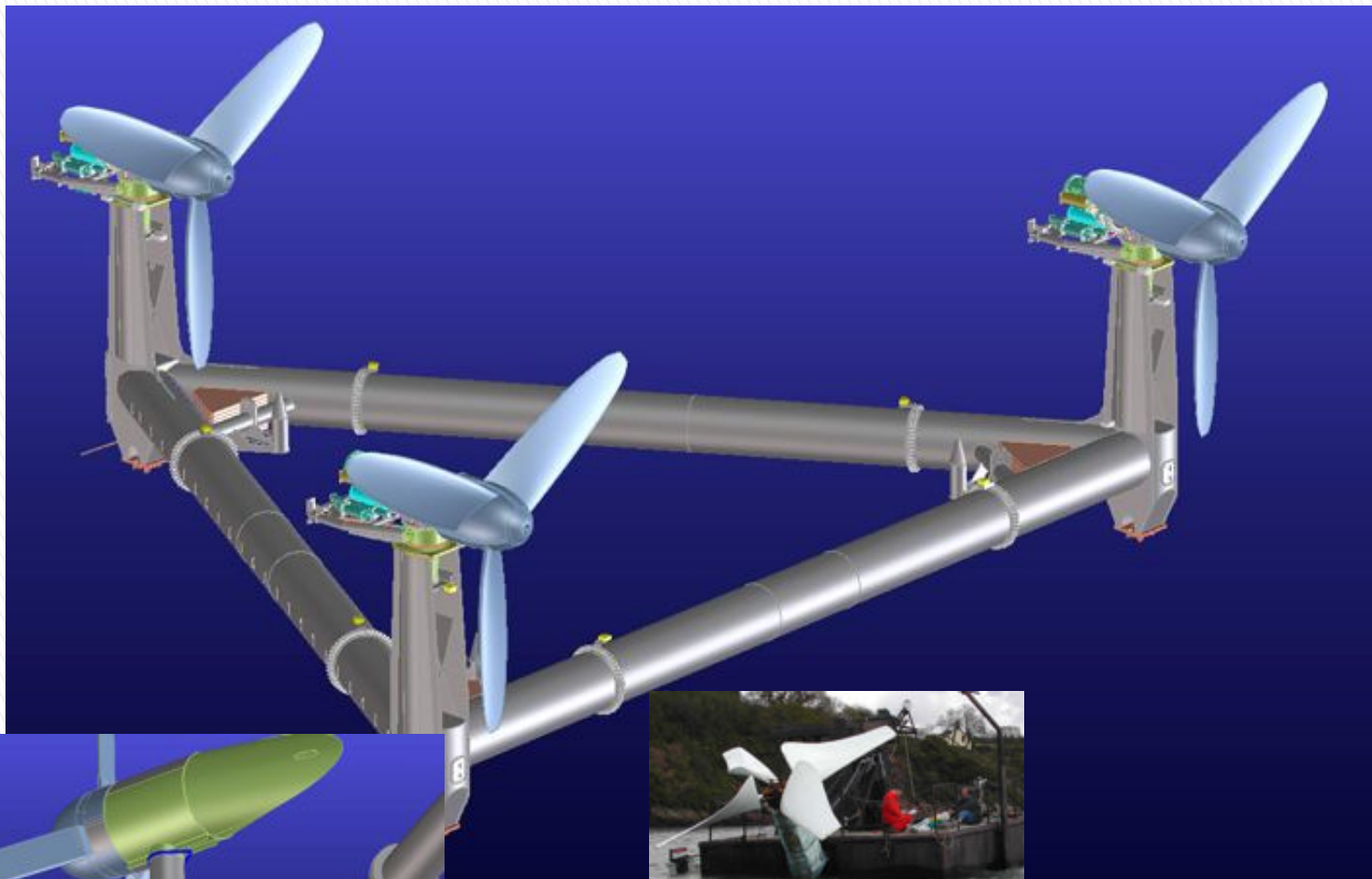


Wind

My Local Off-Shore Wind farm

EBRD – Quartz Matrix

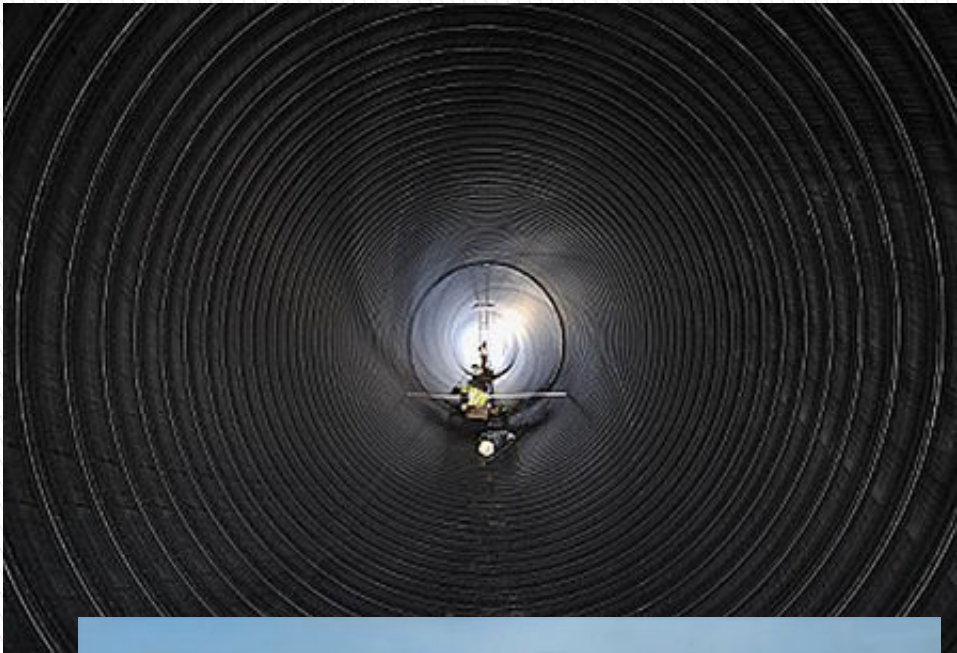




Ocean

Tidal Energy Ltd
1.2MW unit test summer 2014

Renewable Energy at a Brewery



Bioenergy/AD

Gas was fed into the gas grid instead of generating electricity
Heat Pipe Solar heating maximises gas production



250kW unit
Fuel Cell
Unit

Key Features

- High Efficiency
- Low Environmental Impact
- Fuel Flexibility
- High Reliability
- Low noise



Fuel Cell

Electrical power 2.8MWe
Thermal (120/50°C) 1.3/2.2 kW_{th}



Typical Technical Data

Modul	Electrical efficiency	Thermal efficiency	Overall efficiency	thermal efficiency
2G KWK 64 BG	64 kW	85 kW	36,1 %	48,0 %
2G KWK 75 BG	75 kW	89 kW	38,0 %	45,2 %
2G KWK 100 BG	100 kW	121 kW	38,0 %	45,8 %
2G KWK 190 BG	190 kW	218 kW	38,7 %	44,4 %
2G KWK 250 BG	250 kW	290 kW	38,8 %	45,0 %
2G KWK 370 BG	370 kW	431 kW	38,8 %	45,2 %



CHP

Great flexibility and options for
Natural or Biogas feedstock



Summary

- ▶ €79 Billion – 7 years
- ▶ Innovate the way we use Energy, live, sell
- ▶ Fund Development for R&D and Innovation
 - Create Consortiums across Europe and beyond
- ▶ Assist in Commercialisation
- ▶ SME focus for creativity,
 - Flexibility, good value, added value, fast decisions
- ▶ **Large corporation** opportunities for major projects example: energy, aeronautical, automotive, distribution, nuclear, building, cities,
- ▶ Local community organisations can apply

Thankyou

This leads us to the next presentation:

Mr Art de Graaf
International Sales Manager

2G-Energietechnik GmbH



Contacts and Web sites

- ▶ SME actions

http://ec.europa.eu/research/sme-techweb/newsletter/issue19/editorial_en.htm

- ▶ Energy

http://cordis.europa.eu/fp7/energy/home_en.html

- ▶ <http://europa.eu/youreurope/business/funding-grants/access-to-finance/>

- ▶ philbacon@europus.com

