



Engineering Innovation

Emilien Simonot. 04/07/2018. APREN

Agenda

InnoEnergy in a nutshell

Innovation trends in Wind Energy

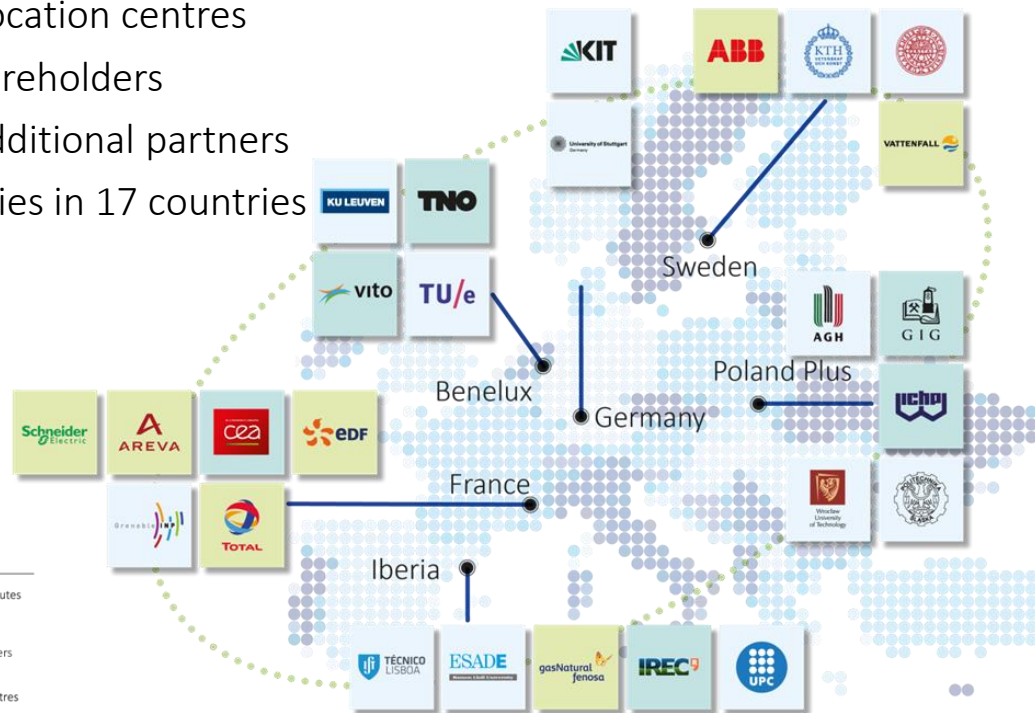
InnoEnergy in Wind Energy

Our experience and practises, serving your success and our sustainability

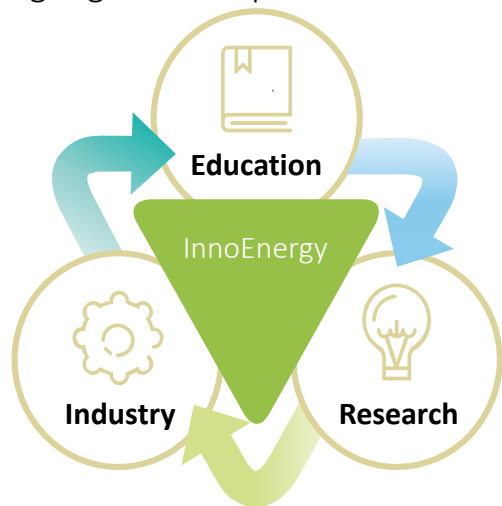
InnoEnergy in a nutshell

The European company for Innovation in sustainable energy

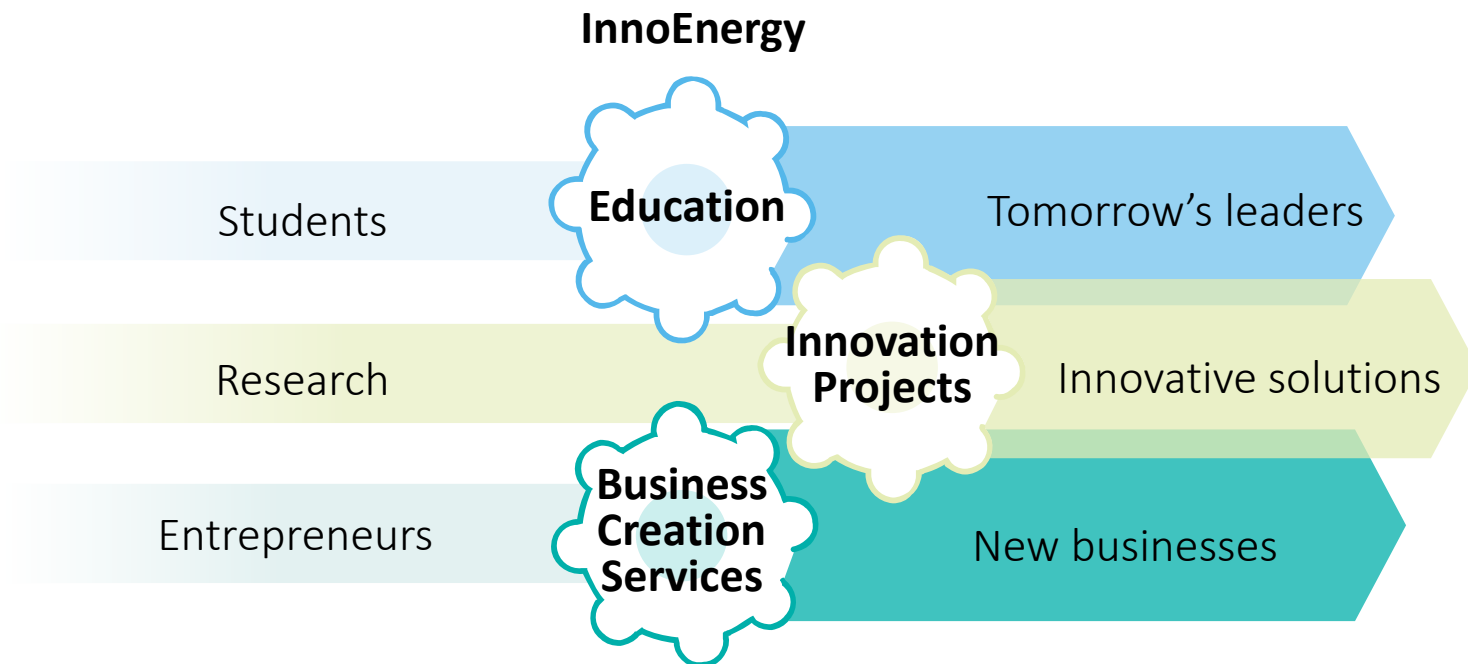
6 co-location centres
26 shareholders
299 additional partners
Activities in 17 countries



Align with EU energy challenges
Strengthen EU innovation
Creates tomorrow's entrepreneurs
Increases sustainable growth
Encourages global competitiveness



The Innovation Engine for Europe



Our services.

Education

Business Creation

Innovation Projects

(01/2017)

494

Gamechangers from the
InnoEnergy Master's School

11,000

Applicants to the InnoEnergy
Master's School

9/10

Graduates who find
a job within six months
of graduating

15%

Average annual salary
earnings over graduates
of similar programmes

200

PhD candidates supported

36

PhD graduates

8

Professional MOOCs

171

Early start-ups
supported

95

Companies
created

55

Million euros
of external
investment raised

2,144

Business ideas
captured

299

Project partners
across
Europe

77

Patents filed

83

Products and services
supported

3

Manufacturing
facilities constructed

157

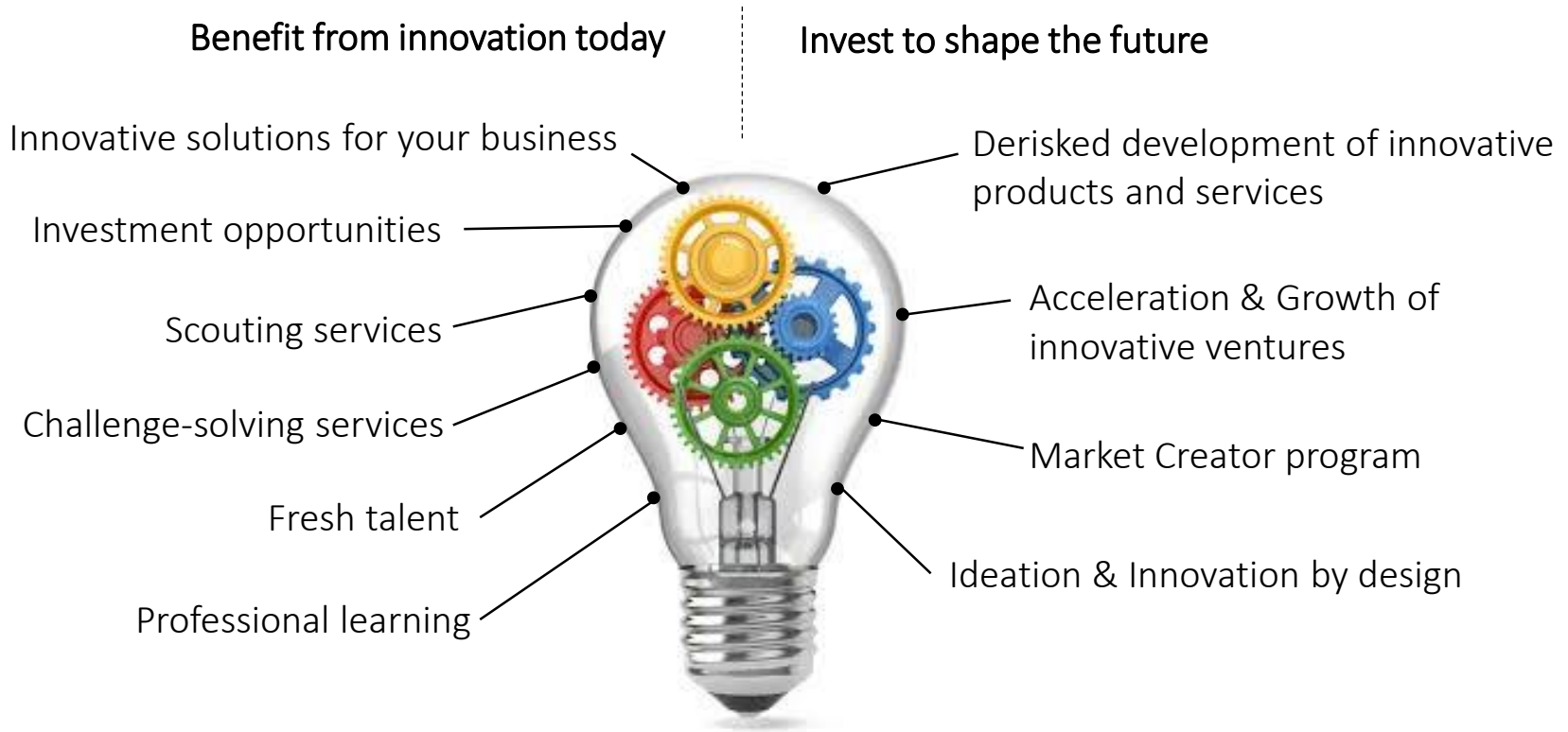
Million euros of InnoEnergy
investment

1.3

Billion euros
in project costs

3

Billion euros in forecasted sale



Open, Trusted & Unbiased Innovation Ecosystem

In What? - Thematic fields



Clean coal and
gas technologies



Energy storage



Energy efficiency



Energy from
chemical fuels



Renewable
energies



Smart and efficient
buildings and cities

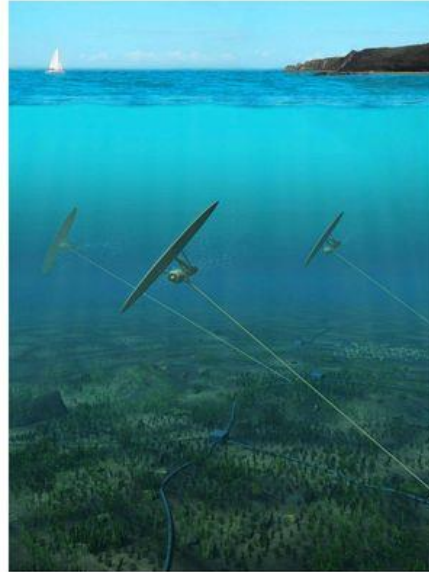


Smart
electric grid



Nuclear
instrumentation -
Renewables conversion

Renewables at InnoEnergy



Innovation trends in Wind Energy

LCOE Decrease: impacts on CAPEX, OPEX & AEP.

Major components:

	Size	Materials	Modularity/ topology	Logistics	Manufacturing
Blade	Beyond 100 m	Coatings Structural	Modular blade designs – sectionable	Transport Construction	Lower CAPEX
Tower	Beyond 150 m	Steel – concrete	Hybrid towers	Transport Construction	On site
Bearings	>10MW (Off.)	Steels		Transport	Lower CAPEX
Gearbox	>10MW (Off.)	Steels Tribology	Mid Speed / Continuously variable		Lower CAPEX
Generator	>10MW (Off.)	Superconductor			Lower CAPEX
Converter	>10MW (Off.)	Solid state Power elec.	DC PTOs		Lower CAPEX
Cabling		Dynamic (Off.)	DC PTOs	Burial and burial depth	Lower CAPEX

Specific offshore wind power topics:

- **Floating Platforms**
 - **Floating structures + Wind Turbines**
 - **Integrated designs (holistic structure / tower approach)**
- **Enabling Technologies**
 - **Robots & Other for under water operation**
 - **Boats**
 - **HVDC solutions**

LCOE Decrease: impacts on CAPEX, OPEX & AEP.

O&M – Smart Wind Farms:

- **Performance management and predictability**
- **Automatisation (robots, drones, etc.)**
- **O&M value chain optimisation (standardisation, desintermediation, predictability, etc.)**
- **Lifetime management**

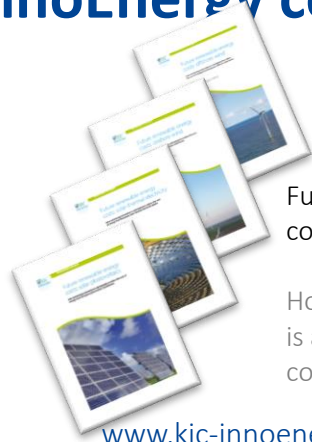
LCOE Decrease: impacts on CAPEX, OPEX & AEP.

Digitalisation – a multi-dimension impact

- **Manufacturing & processes: IoT and Industry 4.0**
- **Multi variable forecasts for wind farm planning.**
- **Smart Wind Farms: control systems, smarter O&M, less human actions**
- **Downstream business: hybrid systems, microgrids, VPP, storage, blockchain**

→ New value and new business opportunities.

InnoEnergy cost reduction analysis toolbox

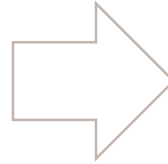
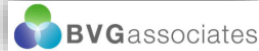


Future renewable energy costs series

How technology innovation is anticipated to reduce the cost of energy in Europe

www.kic-innoenergy.com/reports

Developed in collaboration with



Online LCOE model for evaluation of impact of Innovation
www.kic-innoenergy.com/delphos

Provide:

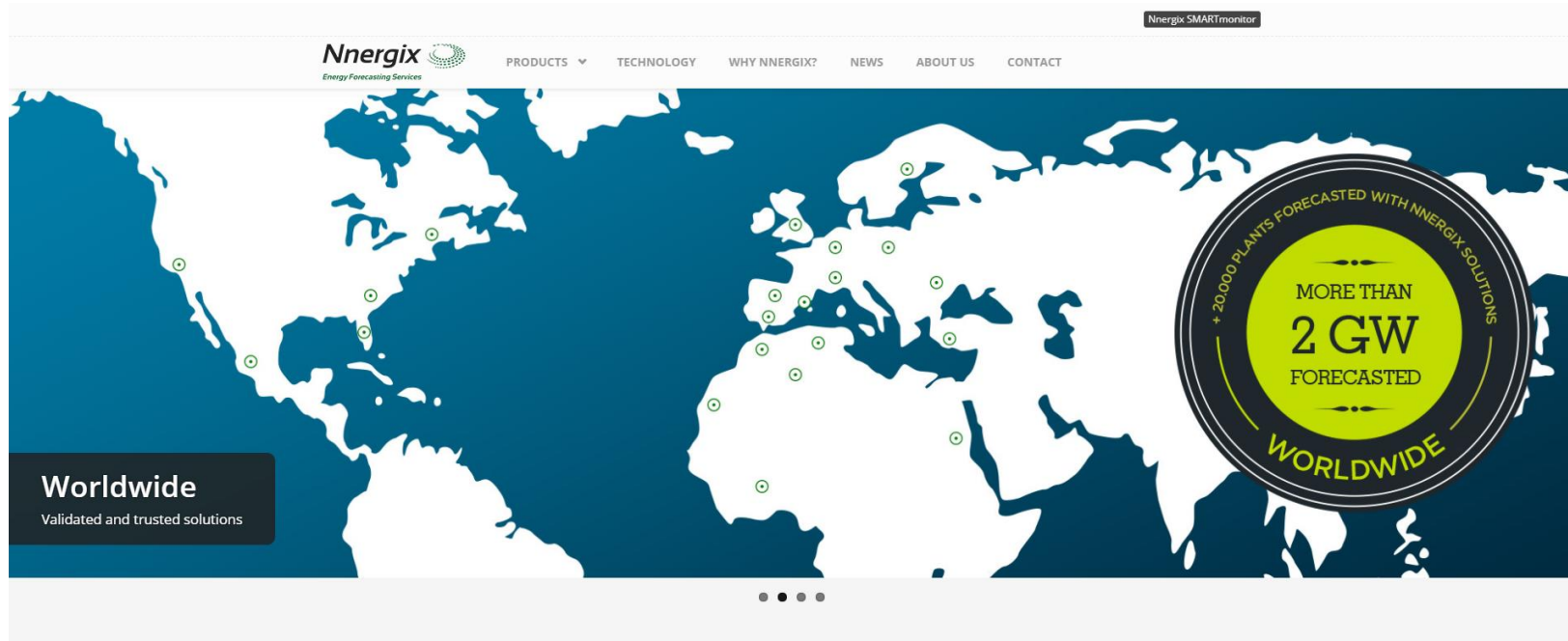
- Reference cost breakdown of renewable energy power plants (EU representative)
- List of innovations + impact description
- Focus the LCOE debate on innovation

Objective: understand the impact of what we do

- Prioritize
- Invest
- Take decisions
- Serve as reference

InnoEnergy in Wind Energy

Nnergix: www.nnergix.com



Energy Forecasting & Smart Grid Management Solutions

+20,000 renewable energy power plants forecasted by Nnergix's solutions worldwide.

Microlubgear

Micro-fabrication
technology for lubrication
of pitch-gear tooth in
wind turbines



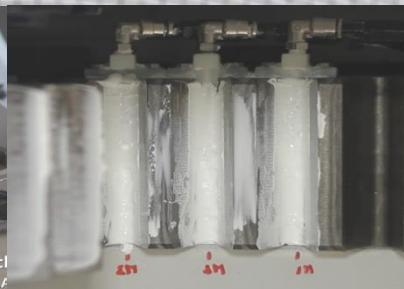
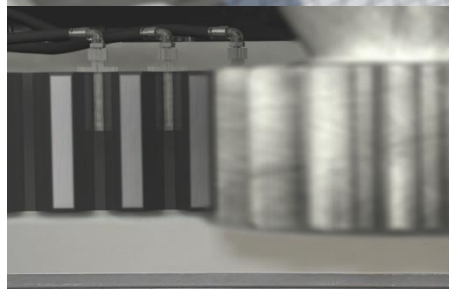
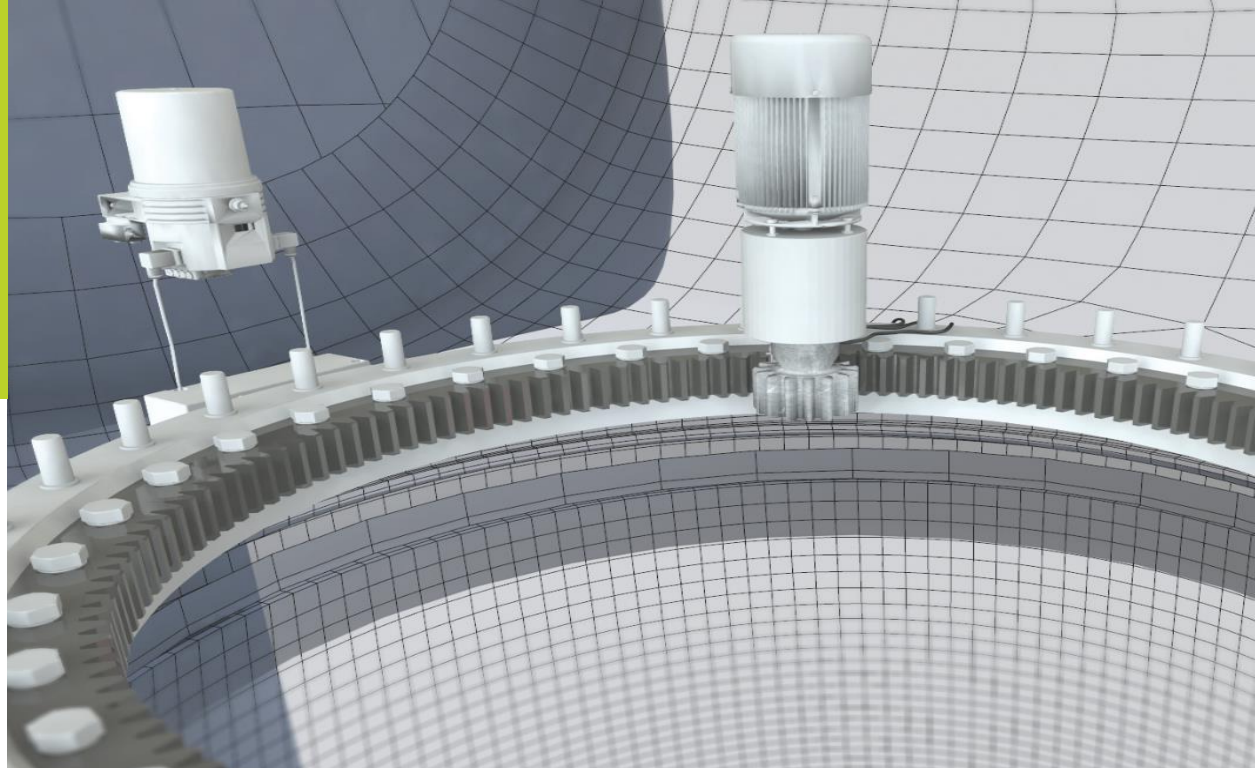
Commercialising company

GT RIVI

www.rivi.net

Benefits:

- Reduce bearing failures.
- Reduce WTG downtimes.
- Reduce maintenance.



Eolos Floating Lidar Solution: www.eolossolution.com



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Your trusted turn-key partner for offshore wind measurements

Windfloat



WindPlus



Innovation projects commercialising partners



windcrete

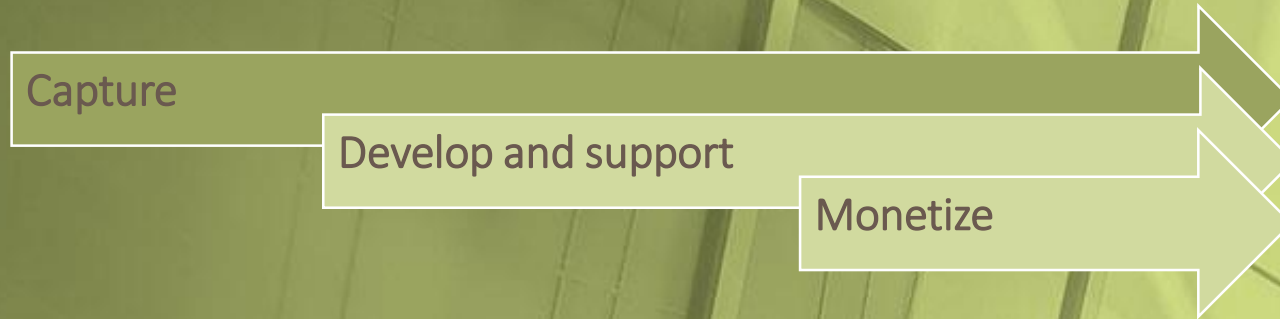
Q M C V I B R O



Ventures



Our experience and practises, serving your success and our sustainability



Capturing

Entrepreneurs

SMEs

Corporates

Research

Intake open all year round

InnoEnergy Investment round – 2 cut off date/year, April - October

How?

Contact our teams or get in touch at our open events:



Developing & supporting

Entrepreneurs

SMEs

Corporates

Research

Highway®

Time to market 2 y
Max. 150k€ funding
ROI: equity

Boostway®

Internationalisation/
industrialisation
Max. 200k€ funding
ROI: revenue sharing

InnoEnergy Innovation project

TRL>5 – EU consortium
Time to market max 5 years
multi million € project – ROI: revenue sharing

Monetizing

- Marketing and communication support: events & PR
- Unique business development and sales support across Europe
- Large accounts managed across Europe + dozens of commercial relationships
- Matching Innovation with business needs
- NEW: US landing program ([link](#))
- InnoEnergy Venture Capital community ([link](#))
- Fully commercial oriented events:
 - TBB ([link](#))
 - Reverse pitch sessions



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www.innoenergy.com



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