ADEME

François MOISAN
Executive Director Strategy Research International
Scientific Director
ADEME

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Agence de l'Environnement et de la Maîtrise de l'Energie

Investment for the future (PIA) : increasing the pace of innovation in 22 thematic fields

Program « Demonstrator for energy and ecological transition »

- Buildings
- Biodiversity
- CO2 capture, storage and utilization
- Biochemistry
- Wastes and industrial ecology
- Soils depollution
- Wind energy
- Marin energy
- Solar energy
- Water
- Geothermal
- Industrial Processes
- Smart grids
- Energy storage
- Hydrogen and fuel cells

Program « Future vehicle and transport »

- Electrical vehicle and charging infrastructures
- Hybrid and thermal Motorization
- Lighter Vehicle
- Trucks
- Mobility and logistic
- Railway
- Future boats

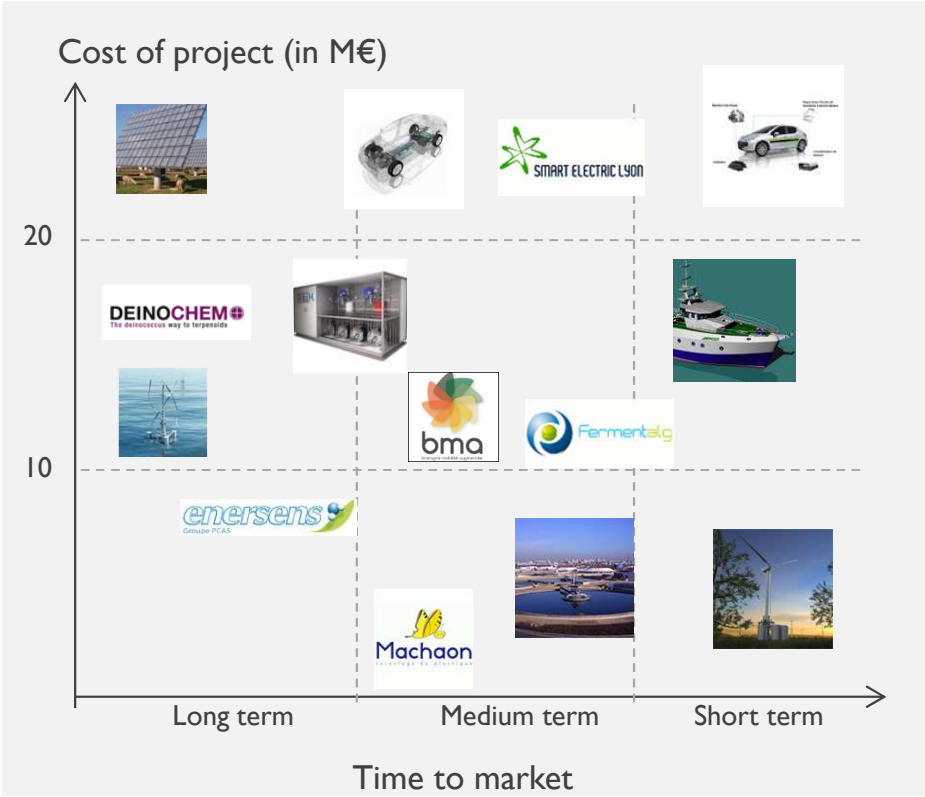
Objectives

PIA role is to promote innovation in the framework of energy and ecological transition through :

- **RDI funding**
- **Sharing the risk of market barriers for innovative options**

Investments for the future program (PIA) supports a large diversity of projects

Projects funded variety



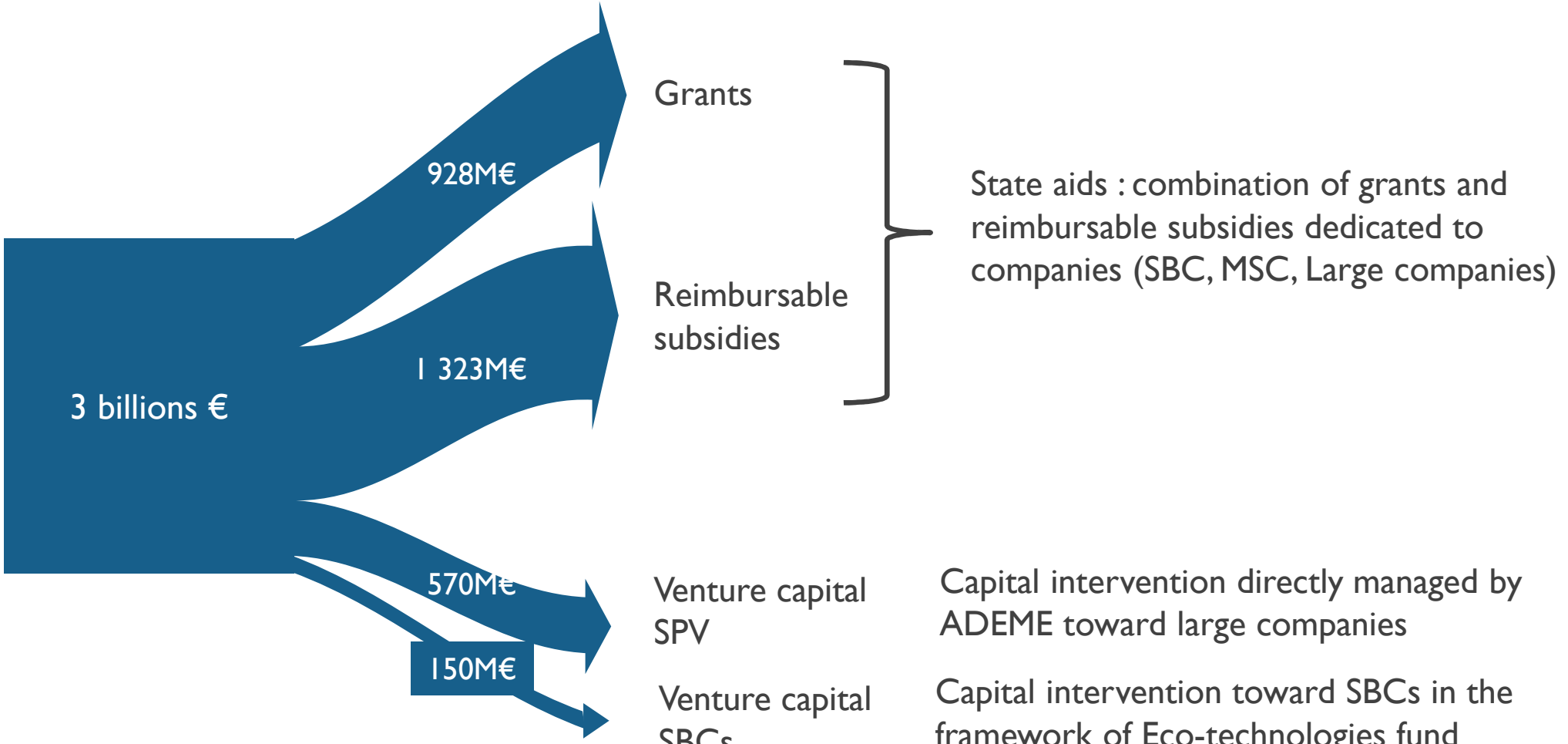
Large diversity of projects funded

- In term of projects cost
  - Median value cost 0,9 M€ average cost 10M€
  - 80% of projects represent 35% of credits
- In terms of maturity

Selected projects :

- Technological Innovations
  - Research demonstrators
  - Industrial research, experimental development
  - Pre-industrial experimentation/ first industrial
- Innovations in term of market, organization…

3 billions Euros, PIA Fund, managed by ADEME for innovation in energy and environmental transition (2011 – 2016)



Investment for the future (PIA) managed by ADEME : 2 intervention modalities

2 modalities of funding not cumulative on the same project

State Aids

Aids with systematic interest of State on project success « aids partially reimbursable »

Grants reserved in priority to public labs

Projects funded through competitive call for proposals.

State aids under the EU framework of State Aids regulation (controlled by EU Commission DG competition)

Capital Investment

Equity and quasi equity

- Public intervention minority
- Co-funding of private actor

Logic of market investor

- No State regulation
- Economic cost effectiveness

Investment for the Future Program (PIA) is effective for innovation enhancement : 2011 – 2016

An innovation tool targeted to companies

- 85% of budget going to companies
- Half of beneficiaries are SBCs

2 kinds of call for proposals (CFP):

- CFP for Projects of large size

- Contracts with reimbursable aids :
  - 2.6M€ reimbursable aid in average by partner
  - 380k€ grants in average by partner (mainly for public labs and SBCs)
- Each project is conducted by a consortium of 4-5 partners (large company, SBCs, public lab)

- CFP dedicated to SBCs : only grants, maximum aid 200 k€

PIA : a powerful tool for innovation

- 67 CFP for large projects since 2011
- 13 CFP dedicated to SBCs since 2015
- 502 projects selected
- 1519 contracts funded
- Strong leverage effect : project cost / public aid = 2.9

Important amount for each category

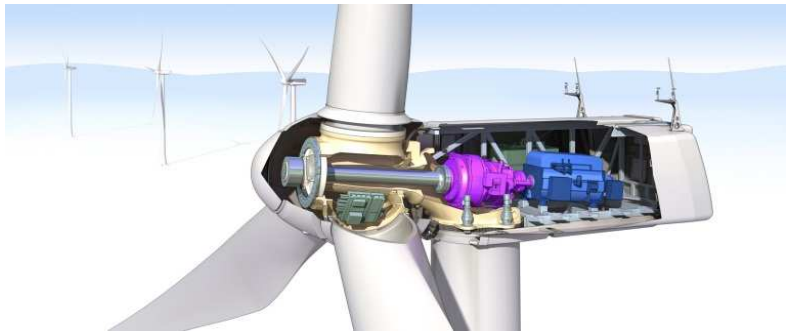
- 1.247 billion € engaged (as Sept 2016) under state aids regime
- 431 M€ invested in venture capital directly by ADEME (through special purpose vehicle companies : SPV)
- 37 M€ invested in SBCs venture capital through dedicated Fund (Eco-technology)

Example of project : ALSTOM OFFSHORE France (SPV Alstom (GE) – ADEME)

Large wind machine

Objective : Industrialization of highly efficient wind generators (6 MW)

- Contribution to 2020 France objective of REN share in energy mix
- Construction of a French offshore wind industry, know-how, employment (creation of 7 000 directs and indirect jobs)
- Deployment of a new machine : Haliade 150 (6MW, pales 150 m diameter, nacelle at 100m)
- Disruptive technologies adapted at offshore (direct drive, generator with permanent magnets..)



Company	ALSTOM RENEWABLE
Total budget	Confidential
Place	Saint Nazaire & Cherbourg
State of implementation	Launched on 21 janvier 2013

Project PV800 : Manufacturing Solar quality Si wafers from metallurgic Si

Diamond wire saw

Coordonnateur

ECM

Partenaires

THERMOCOMPACT

cea

ines
INSTITUT NATIONAL DE L'ENERGIE SOLAIRE

SAFRAN
Herakles

Launched	May 2011
Duration	5 years
Total cost	22.2 Millions €
PIA aid	6.7 Millions €
Type of aid	Grant and reimbursable aid
localisation	Rhones Alpes

ECM is a crystallisation furnace manufacturer. ECM developed an innovative furnace allowing to transform metallurgic silicon in solar quality silicon wafers with a high efficiency and less energy consumed in the process. ECM already sold 10 furnaces at international level.

Project EXOSUN : Solar trackers for utility-scale power plants

Exotrack CPV

Launched	2011
Total investment	12 Millions € (capital investment)
Investors	ADEME, Omnes Capital, EDF-EN, Aquitaine expansion
localisation	France, USA, South Africa

Exosun - founded in 2007 and leader in the French market - designs, develops and supplies the a patented range of solar Exotrack trackers, which can increase the PV power plant yield up to 40%. Located in Gironde, this SME also offers a full range of engineering services covering the entire life cycle of a plant, from the initial studies to commissioning, operation and maintenance.

To date, Exosun has installed a capacity of 400 MW

Example of project GREENLYS

Smart grid Program

Objectives :

- Test and deploy innovative solutions for the electric system (decentralized electricity generation, smart meters, management of distribution grids, new load-shifting and DSM offers and energy management solutions for customers) ;

- Define a value chain for customers, distribution grid managers, energy suppliers, energy generators, industrial equipment manufacturers and local authorities ;

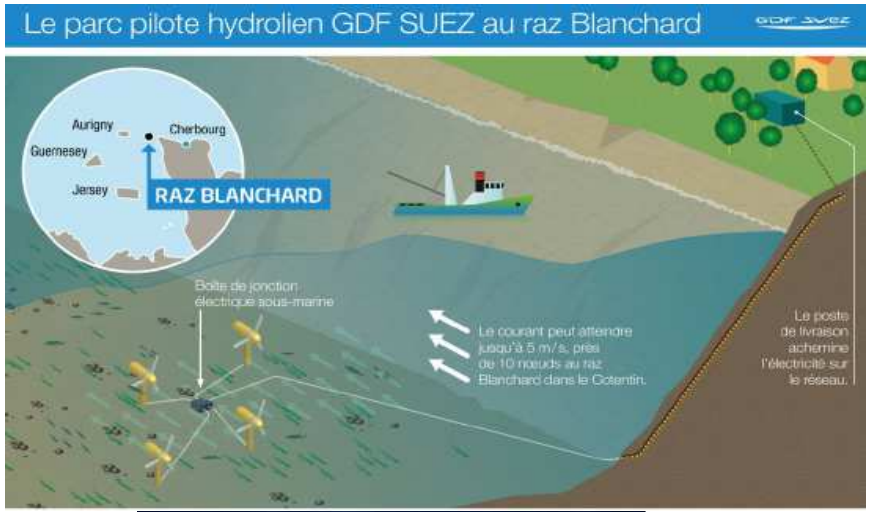
- Design and ensure the integration of components into the smart electric system while conforming to key environmental, societal, technological and economic issues.

Total Budget	36,8 M€
PIA subsidy	9,3 M€
Type of demonstrator	▪ **Urban** ▪ **1000 residential customers** ▪ **40 tertiary sites**
Localization	Lyon & Grenoble
Duration	4 years
State of implementation	100%

Example of project :Tidal Energy Pilot Farms, last step before commercial deployment

NEPTHYD Project : 5.6 MW, 4 turbines
Project cost : 101 M€ subsidies : 51 M€

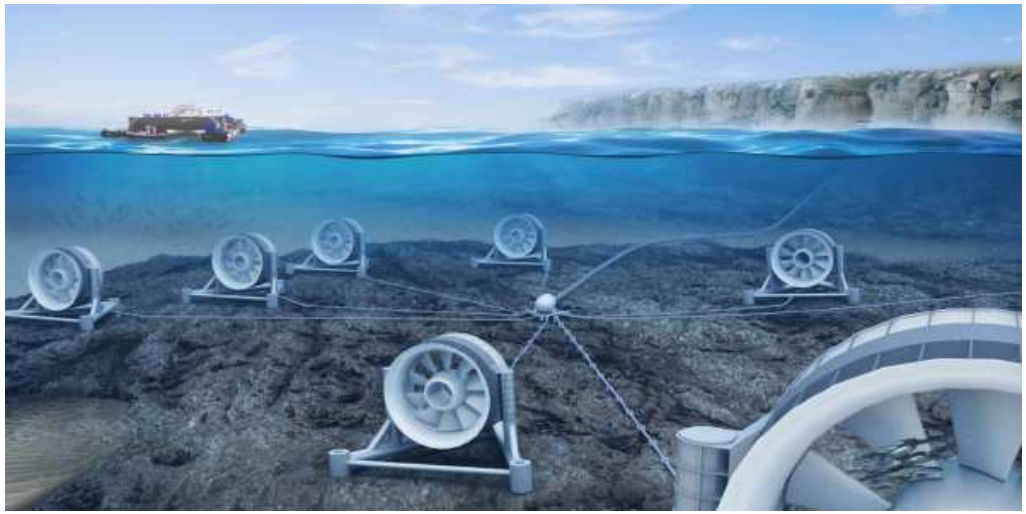
GDF SUEZ ALSTOM

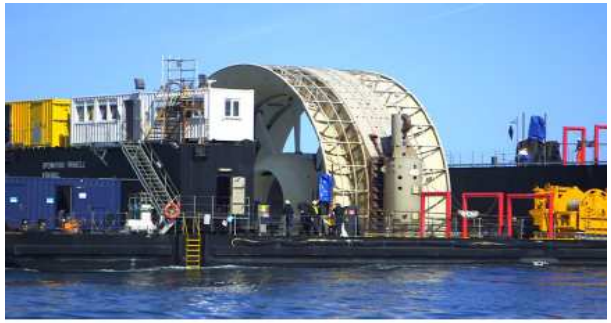


Hydrolienne OCEADE 18 - 1.4 MW

NORMANDIE HYDRO : 14 MW, 7 turbines
Project cost 112 M€ subsidies : 52 M€

EDF energies nouvelles DCNS





Hydrolienne Open Hydro sur la barge d'installation