



# Towards a Low Carbon Society

## ADEME's R&D activities

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## Outlines

- **ADEME's R&D activities and orientations ;**
- **An exemple : NEDO – ADEME energy R&D cooperation ;**
- **Trends on energy R&D international cooperation.**

**NB: ADEME is not a research institute (no labs) nor a research policy maker. ADEME implement the research components of environment and energy policy.**



# The French Agency for Environment and Energy Management (ADEME)

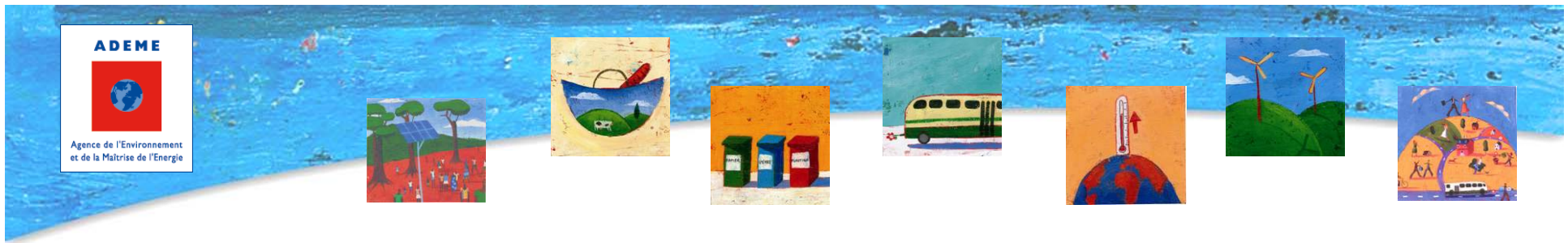
- **A public agency under the supervision of :**
  - The Ministry for Research and Higher Education (MESR) ;
  - The Ministry of Ecology, Energy and Sustainable Planning and Development (MEEDDAT).
  
- **A public agency with four main activities contracted with the French State**
  - Acquire knowledge (R&D) ;
  - Convince and mobilize ;
  - Advise ;
  - Help in decision making.



## ADEME's R&D Key indicators

- **A 2009 budget of €638 million (a €557-million action budget including 50 million euros for R&D and an operating budget of €81 million);**
- **A demonstrator funds in the field of new energy technologies for 400 million euros for the four next years (145 M€ in 2009);**
- **Over 70% of the ADEME's R&D budget dedicates to energy related R&D projects;**
- **A staff of 820 employees including 140 "scientific officers".**
- **30 sites (3 centers, 26 regional implantations, 1 office in Brussels)**





# ADEME's R&D activities and orientations over the period 2007 – 2010





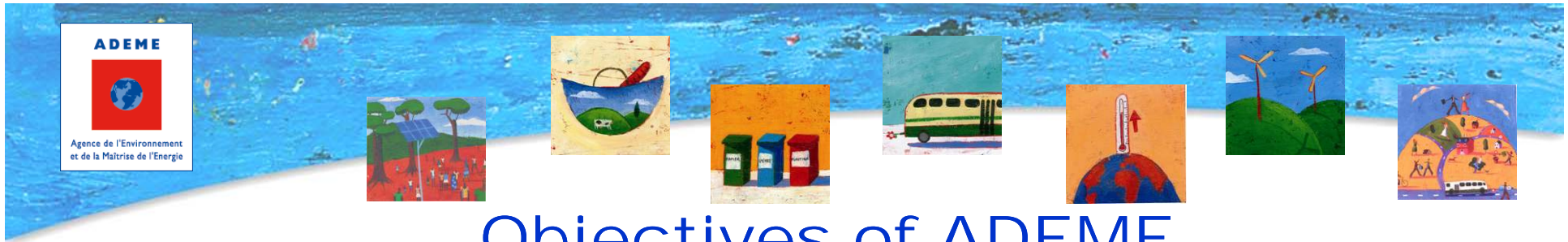
## ADEME's R&D activities

- **Funding research and innovation** in the field of non nuclear energy, energy efficiency, waste treatment, soils and air pollution ;
- Funding R&D demonstration through the recent « **research demonstrator funds** » ;
- Prepare the scientific basis for the implementation of **energy and environmental regulation and standards** (*bonus – malus, ETS...*) ;
- **Build shared technological and societal vision** to drive the R&D programming process (*road maps on private vehicle and fuels combination, on CCS, on 2d generation biofuel...*)
- **Ensure strategic intelligence** regarding technological and societal initiatives than could conduct to significant breakthrough.



## Role of ADEME for R & D

- Orientation, animation, and financing research programmes  
- *“from laboratory to use, and vice versa”*
- Structuration of public and private research  
*Speeding up innovation process*
- Different modalities of support, depending of advancement of research and innovation  
*tenders, demonstration projects, development of methods, ...*
- Each year ADEME finances 80 new PhD's scholarships



## Objectives of ADEME

- Participate to national programmes in energy and environment :
  - *PREDIT, PREBAT, Energy efficiency, etc.*
- Contribute at the EU level to the implementation of the 7th research and development framework programme “energy, environment and sustainable development” :
  - *ADEME is the National Contact Point for energy and environment*
- International cooperation





## ADEME'S involvement in R&D Int'l relationships

- AIE's Implementing agreements and collaborations
  - EUWP, REWP, AGHSET, R&D priority setting...
  - Fuel Cells
  - BIO-energy
  - Buildings
  - PV system & small grids
  - ...
- International Partnership for Hydrogen Economy (IPHE)
- Carbon Storage Leader Forum (CSLF) with Institut Français du Pétrole (IFP) and Bureau de Recherches Géologiques et Minières (BRGM)
- ...



## 10 R&D pilot programs over 2007 - 2010

<b>Development and experimentation of new technologies and social organizations</b>	Clean and energy efficient transportation
	Energy efficient buildings
	Capture and storage of CO <sub>2</sub>
	Electricity production based on renewable resources
	Bioenergy and bioproduct
	Intelligent energy network and storage
	Eco-technology
<b>Acquire knowledge</b>	Impact of air pollution and noise
	Impact of soils pollution and environmental waste assessment
	Foresight and socio-economics



# Some technical programmes





## Clean and efficient transport systems (PREDIT Programme)

- Support Clean and efficient technologies and fuels for transport  
(including efficient batteries for energy storage, performant and hydrogen engines, hybrid systems, fuel cells, biofuels)
- Systemic approach (both organisational and technological)
- Research projects with car manufacturers (to reduce emissions and unit consumptions)
- Research projects with enterprises and cities or groups of cities governments (local, district, regional level)





## Efficient buildings (PREBAT)

- Energy performance of new and existing buildings by year 2050
- A zero energy balance in buildings
- Development of new materials and new technologies for insulation, heating, air conditioning, lighting
- New conception in architecture and construction
- Promotion of high environmental quality
- Study of dwellers behaviour



## Carbon capture and storage, and mineral sequestration

- Reduction of capture and transportation costs
- Testing and validation of technical and geological solutions – storage in deep aquifers or in depleted oil and gas reservoirs with the possibility of recovery of additional oil
- Extending the methodologies : exchanges of experience – exploring all options (trapping CO<sub>2</sub> at source, concentration with combustion using O<sub>2</sub> – transforming fossil fuels into synthesis gas...)
- **CO<sub>2</sub> capture and storage towards a cleaner use of fossil fuels but the societal acceptance is to be experiment...**



## GREEN electricity : PV solar energy

- Increase of cells and modules efficiency (today 7-8 kwp for 10 m<sup>2</sup>)
- Reduction of costs manufacturing
- Improvement of conversion efficiency of solar modules
- Integration of solar modules in buildings
- Better reliability
- Accordance with EU climate-energy package
- In 2008 : 18 MW PV in the grid
- 2020 : 5 800 MW (yearly growth 130 %)



## Biofuels and bio-resources

- Enlargement of the use of different bio-resources from agriculture and forestry
- Production of biofuels from ligno-cellulose biomass conversion
- Studies on gasification of biomaterials to produce biofuels (ethanol)
- Production of synfuel (gasification of organic wastes, wood, feedstocks, etc...)
- **Socio-economic aspects**





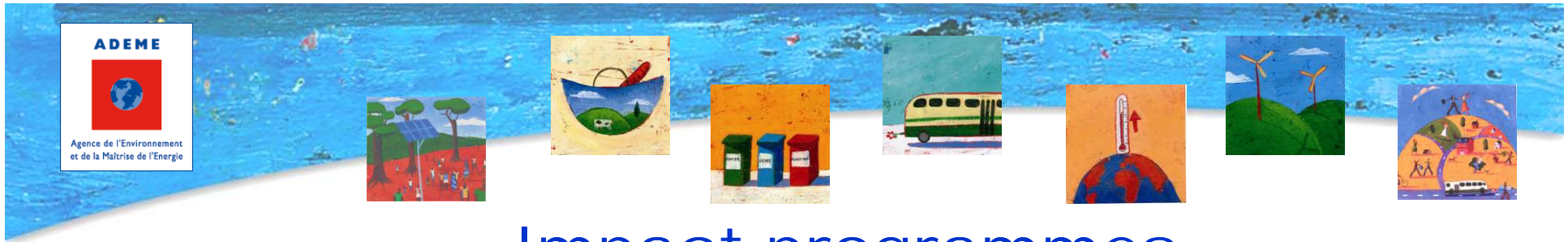
# Environmental friendly technologies

- Cogeneration
- Ecoconception
- Energy efficiency programmes
- Recycling and revalorization
- Innovative chemical and physical techniques
  - Catalysis and photocatalysis,
  - Gasification (solid wastes, sludges, sugarcane and beet wastes, tires, RDF, etc.),
  - Membrane processes,
  - Electrolysis,
  - Treatment of different kinds of sludge (industrial, sewage plants, and dredged sludge)
  - Pipeline integrity management systems (safety and security against illegal tapings) and no-digs pipe-laying
- Biochemical techniques (biofuels, composting, methanization)



# Impact and prospective programmes





## Impact programmes (air, noise, soils, waste)

- To improve the knowledge on pollution
- To develop metrology and new evaluation methodologies
- To develop new tools and studies (for modelisation, characterization, etc.)
- **To study links between health and environment**



## Prospective and socio-economy

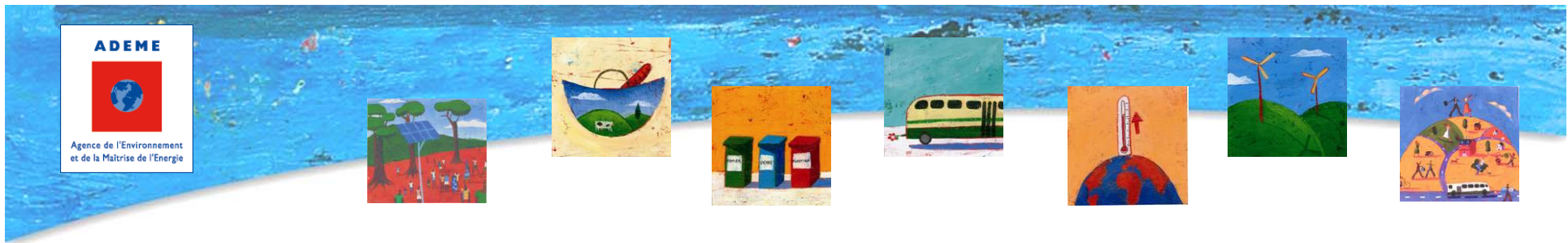
- To define strategies at national, regional and local levels
- To evaluate cost and impacts of new decisions
- To convince decision-makers and suggest exchange and debates among the actors





# An Exemple The NEDO – ADEME energy R&D cooperation





## Why a cooperation between ADEME and NEDO ?

- **A similar energy situation :**
  - Few domestic fossil resources ;
  - High potential for renewable energy development.
- **A complementarity in R&D competences :**
  - Japan is a major player in technological development ;
  - France is a major player in system optimization.
- **Strong industrial links :**
  - Transport sector with the Renault – Nissan cooperation
  - Electricity sector with the EDF – TOYOTA Cooperation (+IERE)
  - Buildings with the links between St Gobain and AIST



## Five objectives for the ADEME – NEDO R&D cooperation

- **Share** visions and roadmaps on energy R&D topics ;
- **Compare** energy R&D programs contents and objectives ;
- **Create** new technological and industrial cooperation between the two countries ;
- **Share and discuss** the *ex post* evaluation results of energy R&D programs ;
- **Discuss** on institutional R&D organization in the two countries ;



## ADEME – NEDO cooperation : The major results

- **2006** : A **kick off** cooperation seminar ;
- **2007** : A seminar on **renewable energy integration in buildings** with the CSTB ;
- **2007** : A seminar on **transportation roadmap** with the IFP and the key French and Japanese cars manufacturers ;
- **2008** : A seminar on **intelligent electricity networks** with EDF R&D





# Cooperation Trends





## The ADEME – NEDO R&D cooperation

- **3 keys orientations are under discussion :**
  - **Co-funding of R&D demonstrators** (especially PV and intelligent electricity networks) ;
  - **Building common technological and societal roadmaps and visions** (ie : urban mobility and urban vehicles) ;
  - **Pursuit of energy R&D program comparison** with a special attention on the **enrollment of industrials** from the two countries.



## Focus : PV and smart networks

- To facilitate RE integration in electric grids
- New tools for grids management
- New technologies (energy storage for instance )
- In France, a R&D program coordinates by ADEME to be implemented
- In Europe a technologic platform (Smart Grid) gathered private and public stakeholders
- A demonstrator with NEDO in discussion (Japanese background of Ota City – 533 houses or MEGA SOLAR Plant in Hokuto - 2MW in 2010).



# The R&D cooperation with the European and developing countries (1/2)

## *At the European level*

- Studying the **opportunity** created by the **joint programming process** (*UE communication on Joint Programming*) ;
- **Create a regular dialogue** with the DG research on **the R&D priorities included in the FP 7 working program** (*18th September seminar on biofuels, energy efficiency and renewable energies*) ;
- **Pursue** our enrollment in **the ERA-Net**.

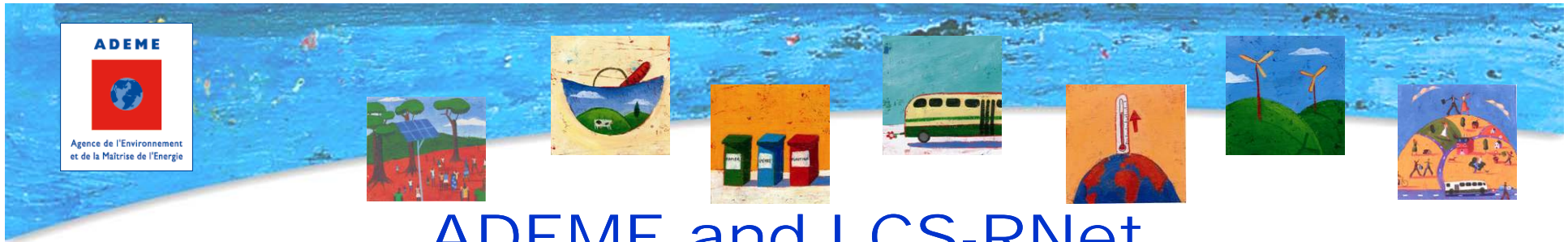




## The R&D cooperation and developing countries

### *The developing countries :*

- **Today** : No specific R&D cooperation with the developing countries;
  
- **Tomorrow** : **Strategic cooperation on particular topics** :
  - Mediterranean countries on solar energy;
  - Using ADEME – CNRS agreement to create a R&D cooperation with China;
  - Biofuels with Brazil;
  - ...



## ADEME and LCS-RNet

- **ADEME is interested in contribute to the development of a research community dedicated to LCS.**
- **ADEME can experiment and implement the responses proposed by the LCS-RNet. Especially among the society and in collaboration with local authorities...**
- **ADEME can contribute to share and to disseminate the results in the local, national, European and international spheres.**



Thank you for your attention !

Don't hesitate to contact

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