



# Wind Energy Integration in the Urban Environment

## Study Tour

Amsterdam – October 26th -27th 2006

Intelligent Energy  Europe



# GENERAL FRAMEWORK

# Wind energy integration in the urban environment

**Objective : Promote the general knowledge and the development of urban wind turbine in partners countries and Europe**

WHY ?

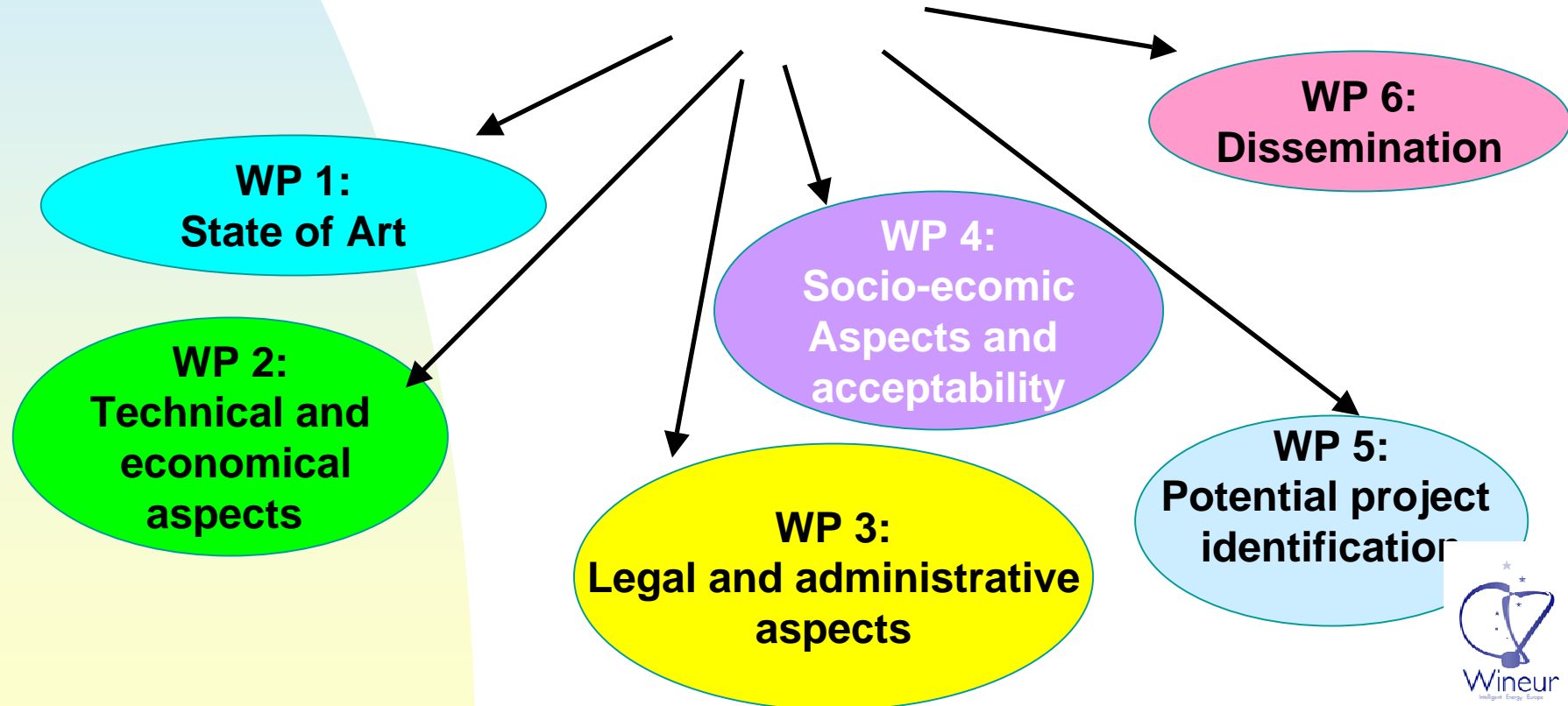


To contribute to the:

- 👉 European target for renewable energy of 12 % within 2010 ;
- 👉 Reduction of CO<sub>2</sub> emissions ;
- 👉 Creation of sustainable communities across Europe ;
- 👉 Creation of new market opportunities & local jobs

# Wind energy integration in the urban environment

HOW ?



# Wind energy integration in the urban environment

WP	Topic	2005												2006												2007					
		Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Nov	Dec	Jan	Feb	Mar	April				
1	State of the art	█																													
2	Technical & economical aspects			█				█																							
3	Legal & administrative aspects			█																											
4	Socio-Economic aspects & acceptability			█																											
5	Potential project identification				█																										
6	Dissemination & Website				█																										

Completed work

# Wind energy integration in the urban environment

***State of the art & experiences gained***

**Review of the:**

- ◆ **existing technologies**
- ◆ **technologies in development**



**Catalogue of wind turbine manufacturers and operators  
Available on Project website:  
[Urban-wind.org](http://Urban-wind.org)**

# Wind energy integration in the urban environment

## *Technical and economical aspects:*

- **General economical data**
- **Typical costs**
- **Grid connection issues**



Reports and documents  
available on Project website:  
[Urban-wind.org](http://Urban-wind.org)



# Wind energy integration in the urban environment

## *Administrative an planning issues:*

- Legal framework
- National planning policy
- Administrative and planning barriers



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Works in  
progress

# Wind energy integration in the urban environment

## *Socio-economical Survey:*

- **Attitude regarding energy**
- **Opinion on some urban wind turbine**
- **Opinion on the best implantation of urban wind turbine**
- **Foreseen obstacles to wind turbine installation**
- **Individual socio-economic criteria: niceness, size, safety, noise, energy balance, financial balance, attitude regarding (renewable) energy, experience with (renewable) energy**
- **Level of acceptance of urban wind turbine on roof**

# Wind energy integration in the urban environment

## *Potential sites Identification:*

- **Site constraints: legal, technical, socio-economical**
- **Wind potential assessment**
- **Appropriate technology definition**
- **Economical analysis (electricity production, external costs avoided..)**
- **Design of project:**
  - urban integration**
  - architectural integration**

# Wind energy integration in the urban environment

## *Dissemination phase :*

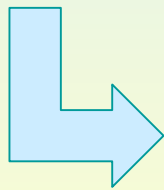
- **Raising awareness in local communities**
- **Raising awareness of decision makers in city councils**
- **Facilitating information exchange between town planners and project developers**
- **Identifying potential projects and actors**

Focus on  
technologies and  
costs

# Wind energy integration in the urban environment

## *Main French features:*

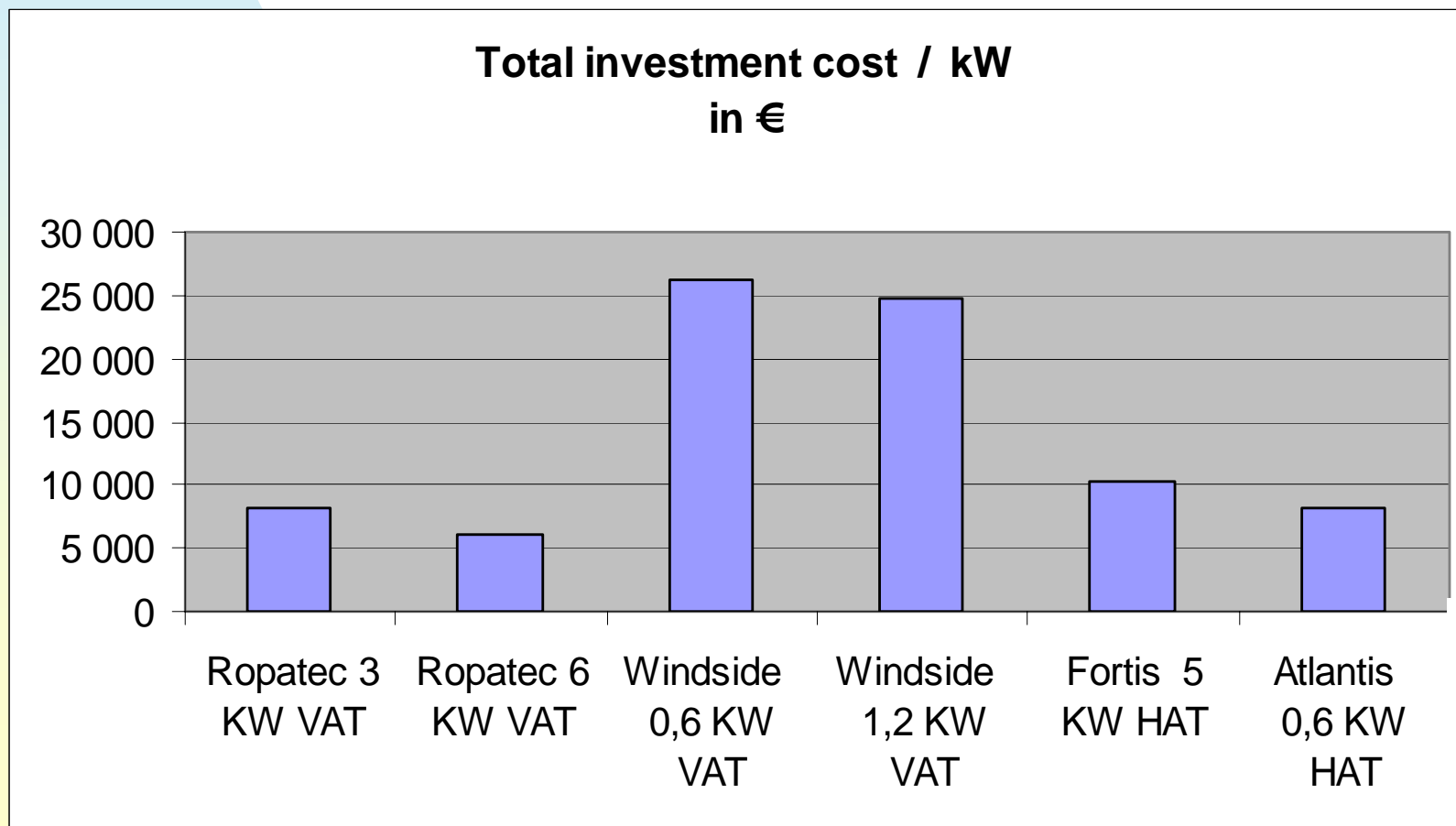
- Absence of technology support policy
- Absence of feed in tariff
- Market just emergent



Investigations were led with the four following manufacturers:  
**Ropatech- Fortis- Atlantis- Oy Windside**

# Wind energy integration in the urban environment

## Comparison of the capital costs





# Wind energy integration in the urban environment

## Productivity of the different wind turbines

