Wind Power in France: Present status, Prospects, Opportunities for Investors

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- **Wind energy status and prospect**
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  - ⇨Potential development
- **Investing in wind power in France**
  - ⇨Projects under 12 MW
  - ⇨Onshore and offshore calls for tenders for projects beyond 12 MW
- **Conclusions**

Part 1: The French Energy Policy Context

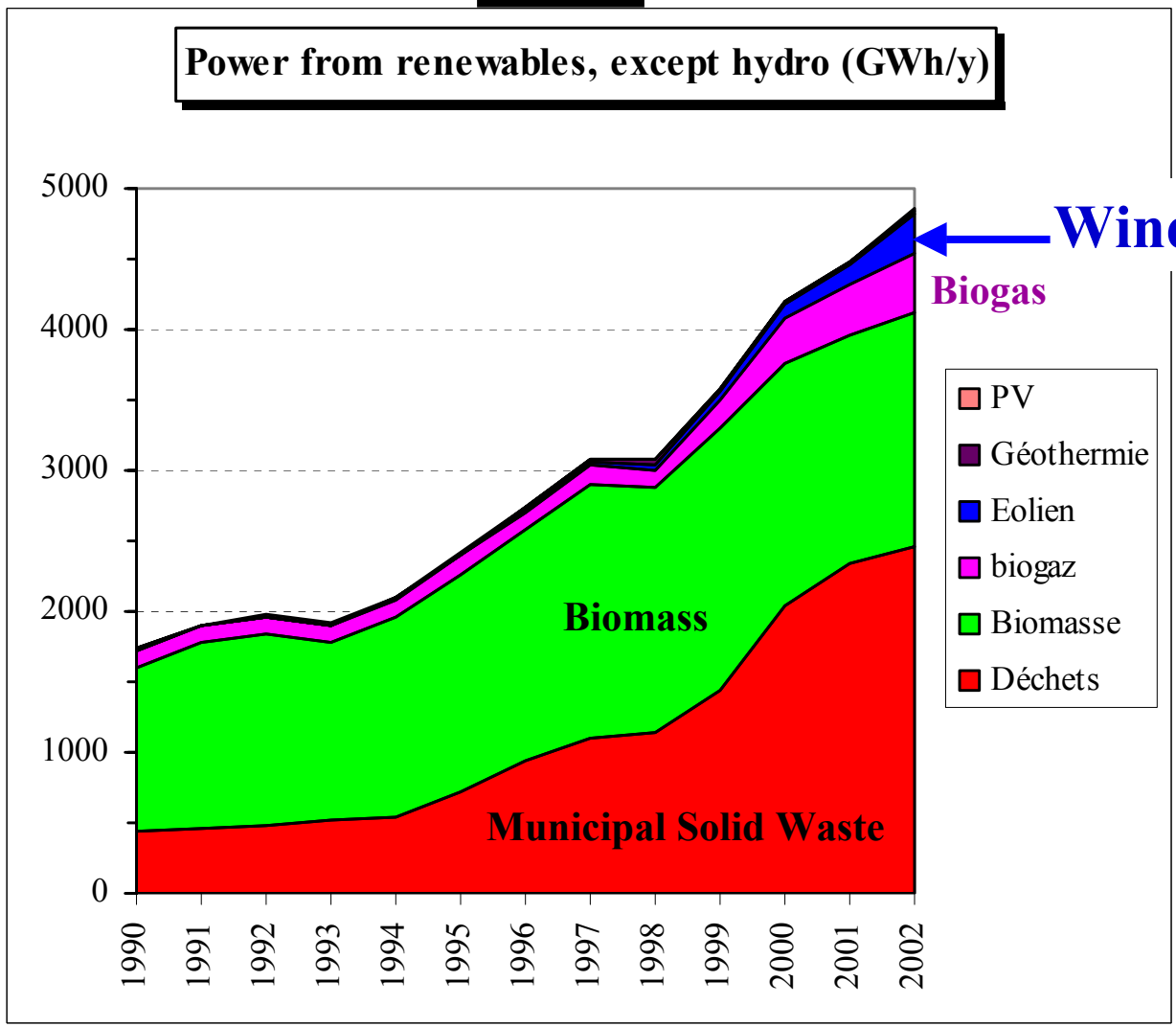
- **A national public debate in 2003**
- **A new "Energy Law" setting the long term energy policy framework to be passed in May or June 2004**
  - ⇨Proposal adopted the in council of Ministers on May 5th 2004
  - ⇨To be discussed in the French Parliament on May 18th 2004
- **Emphasis on:**
  - ⇨Energy efficiency : from a "white certificates market" (UK)
  - ⇨Renewables :
    - ✯**21 % target of RES for electricity in 2010 confirmed**
    - ✯Ambitious target for renewables for heat (+ 50% in 2015)
  - ⇨Nuclear: a first 1.6 GW EPR (AREVA-SIEMENS technology)

The French context for Power from Renewables

- **Official goal within the European 2001 directive:**
  - ⇨21 % of electricity consumption from renewables in 2010 (approximatively + 30 TWh/year of "new" renewables)
- **Up to 75% of new "renewable electricity" from wind power to reach this 21 % target**
  - ⇨Government 2002 "PPI" report: "**7 to 14 GW of wind power**"
- **7th March 2003 decree on mandatory 2003-2007 Power Production increase Planning ("PPI"):**
  - ⇨**Wind Power: + 2 000 to + 6 000 MW**

    of which offshore: (+500) (to +1500)
  - ⇨Biomass + biogas+ MSW: + 350 to + 700 MW
  - ⇨Hydropower: + 200 to + 1000 MW
  - ⇨Geothermal energy + Solar PV + 11 to + 110 MW

Past RES for power, beyond 70 TWh from Hydro



Part 2

Wind Energy Status and Prospect

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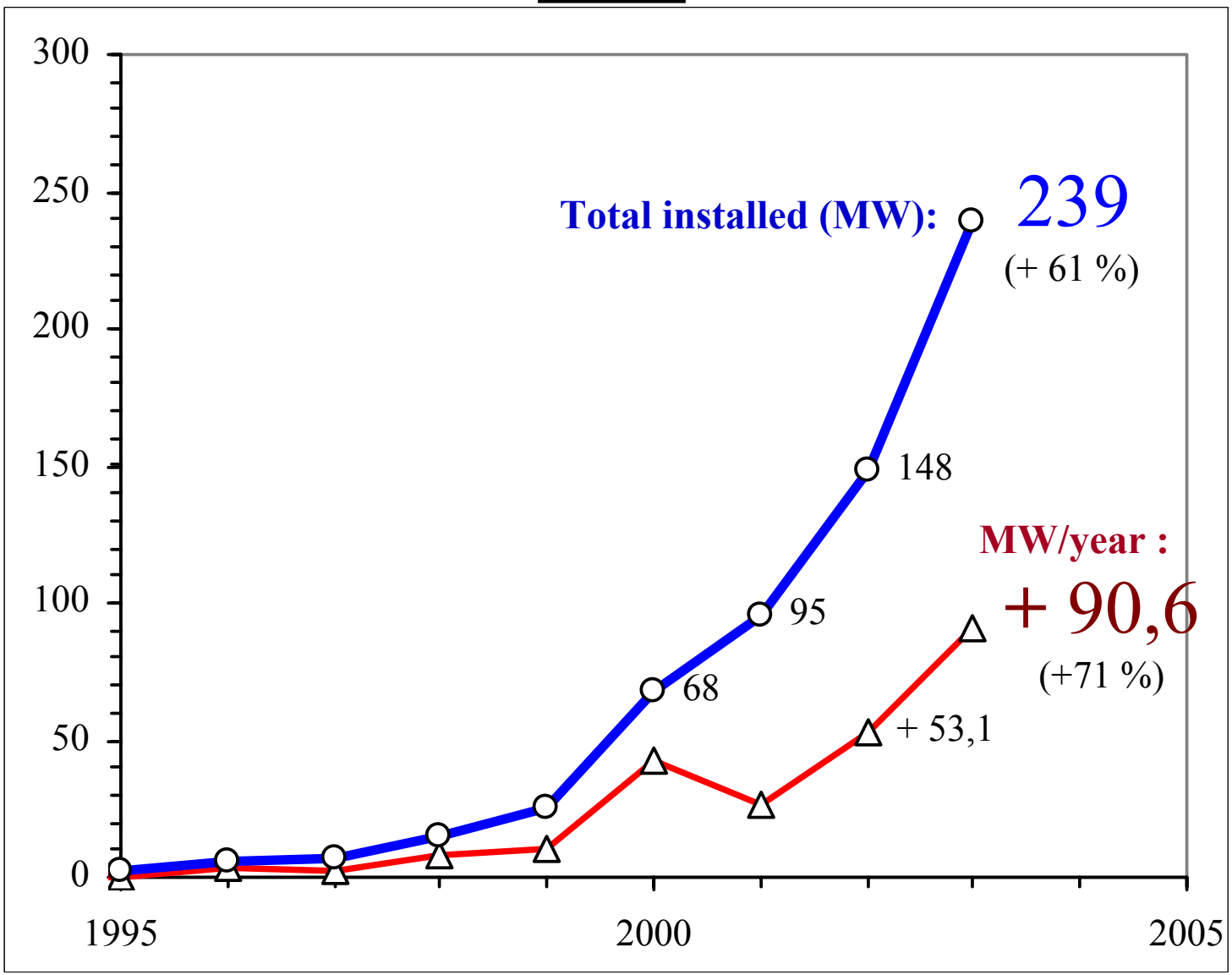
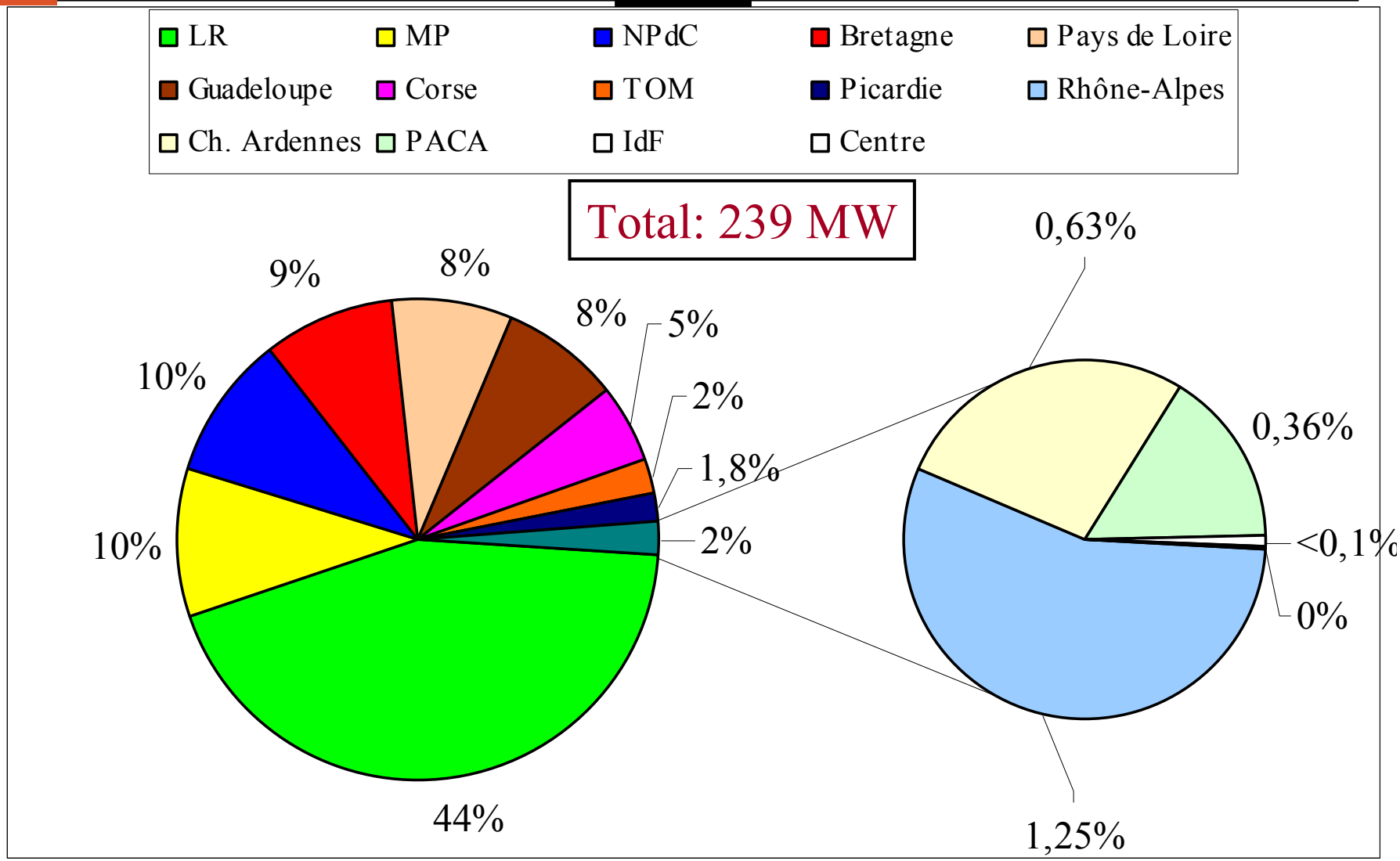
Recent wind power development in France



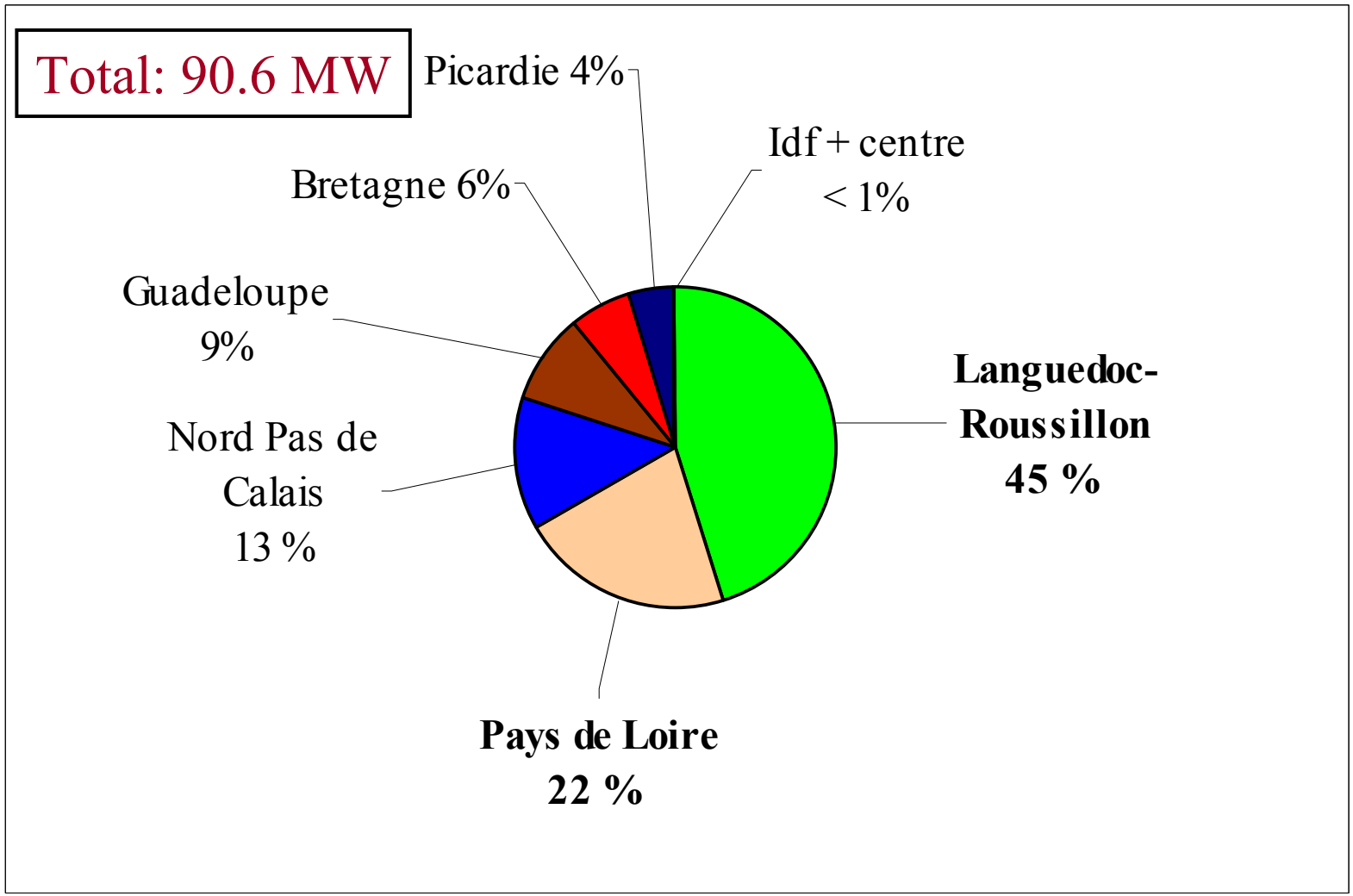
Source: B. Chabot, ADEME, from WWW.suivi-eolien.com data

End of 2003 regional share of Wind Power (1)



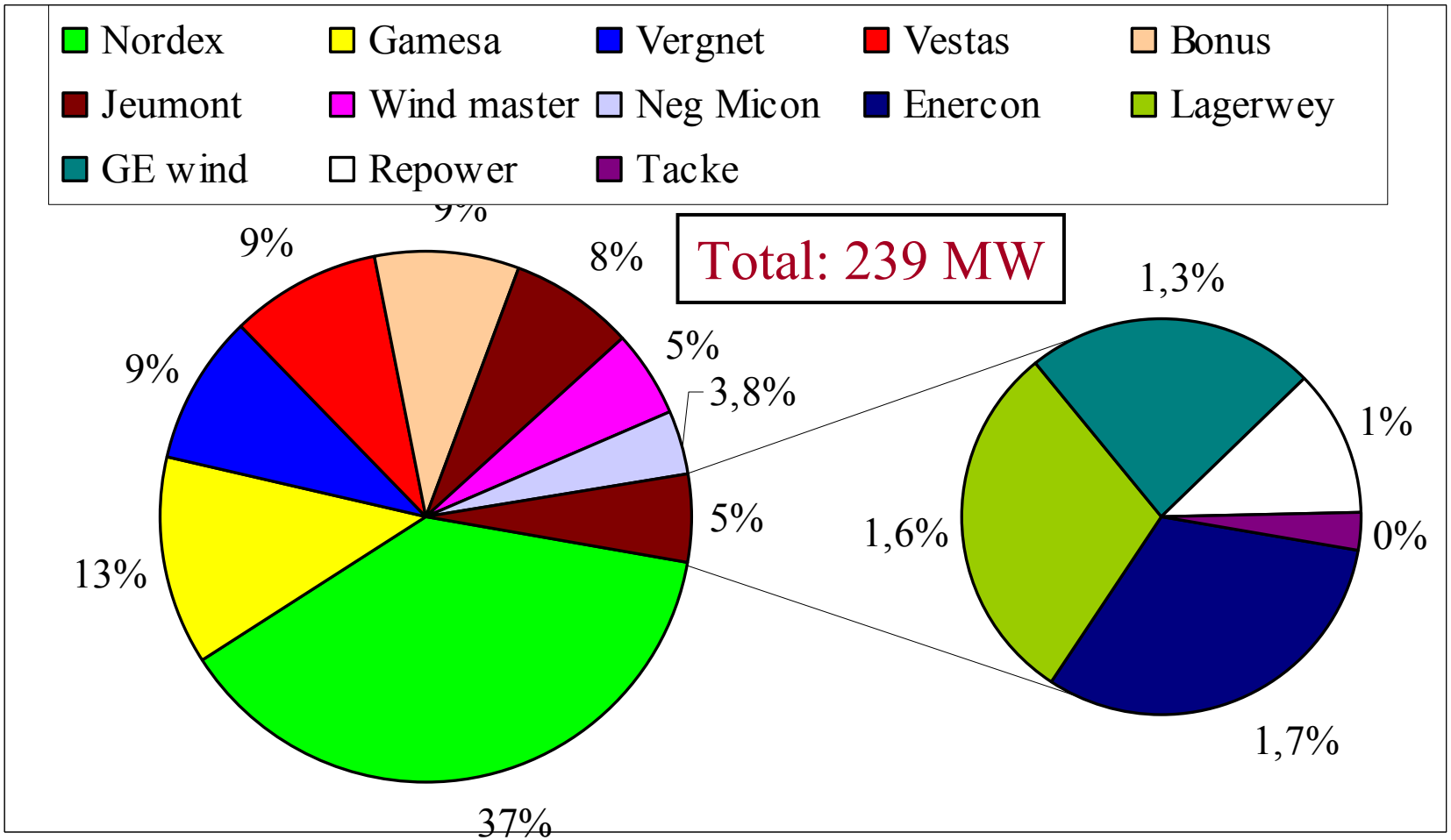
Source: B. Chabot, ADEME, from WWW.suivi-eolien.com data

Regional share of the 90 MW installed in 2003



Source: B. Chabot, ADEME, from WWW.suivi-eolien.com data

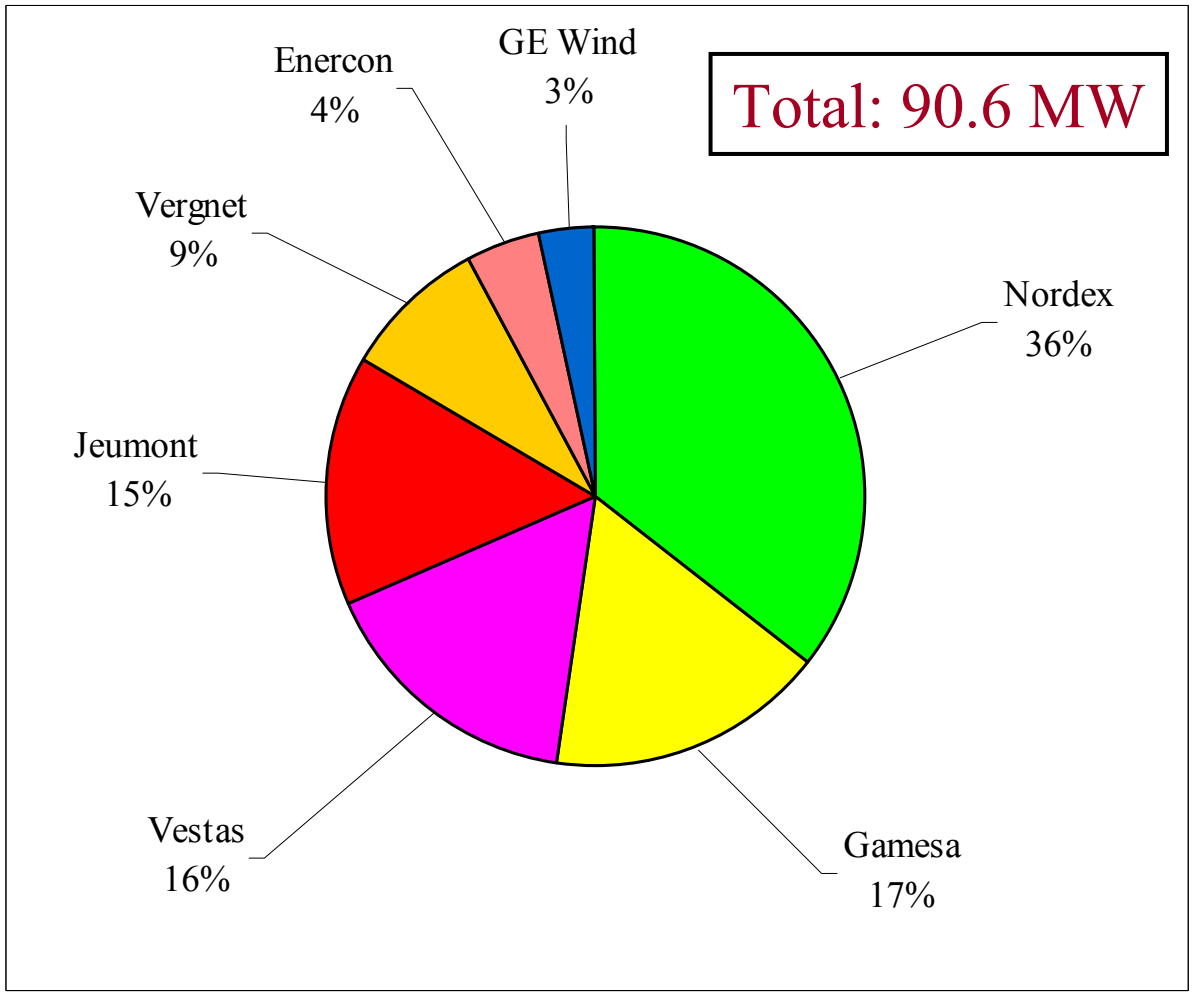
Market Share on Total Installed Power



French manufacturers (Jeumont + Vergnet): 17 %

Source: B. Chabot, ADEME, données WWW.suivi-eolien.com

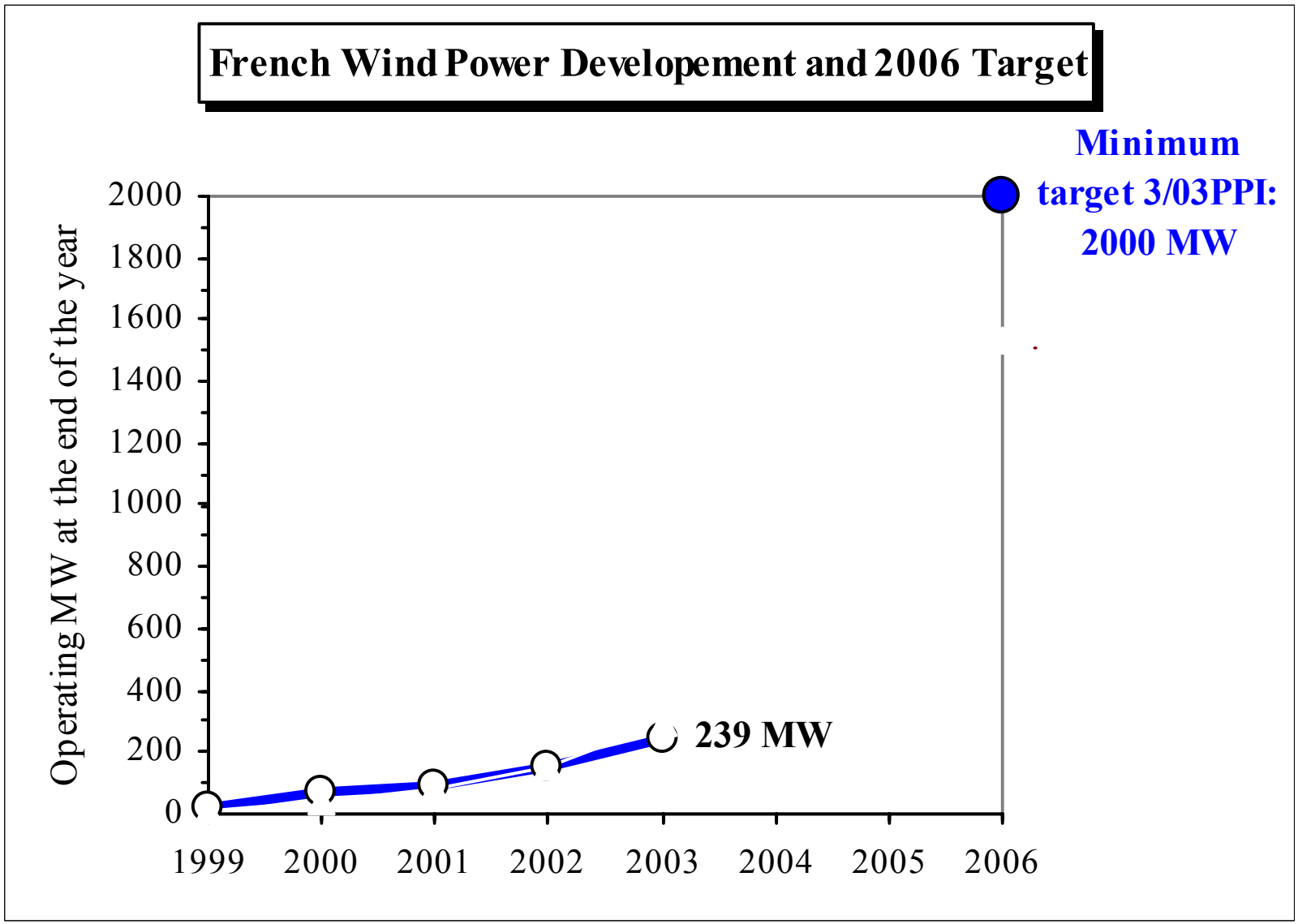
Market Share on 90 MW installed in 2003



French manufacturers (Jeumont + Vergnet): 24 %

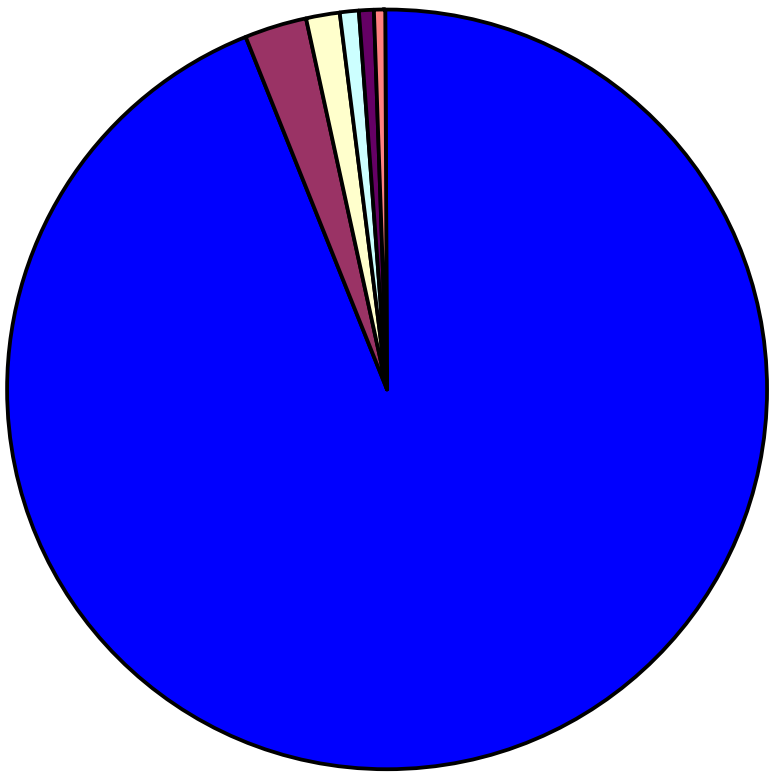
Source: B. Chabot, ADEME, données WWW.suivi-eolien.com

Development of wind power and 2006 target



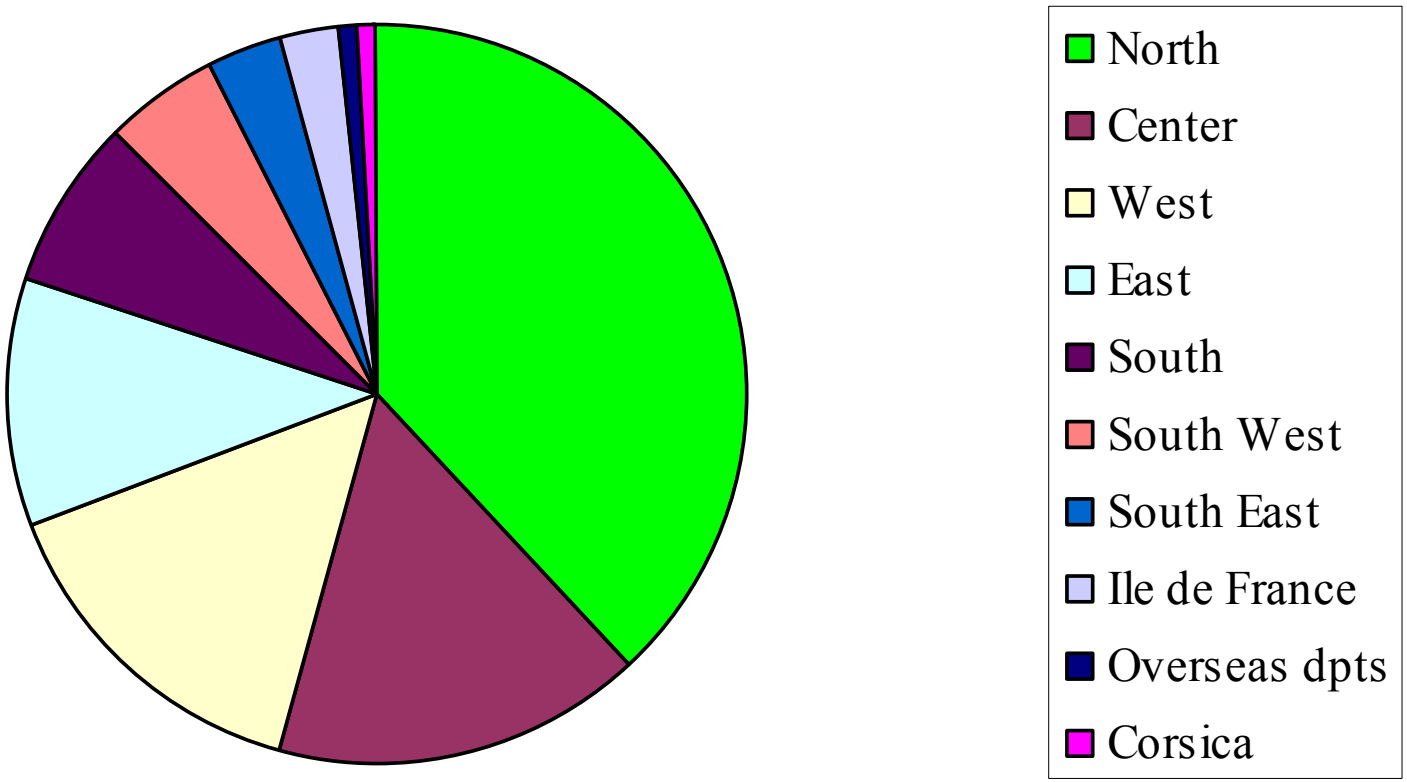
End 2003 status for distr. grid access application files

- **Total (only on the < 50 kV grid) : 16347 MW**
- **Wind: 15 354 MW (94 %)**



Source: EDF : http://www.edf.fr/index.php4?coe_i_id=14012

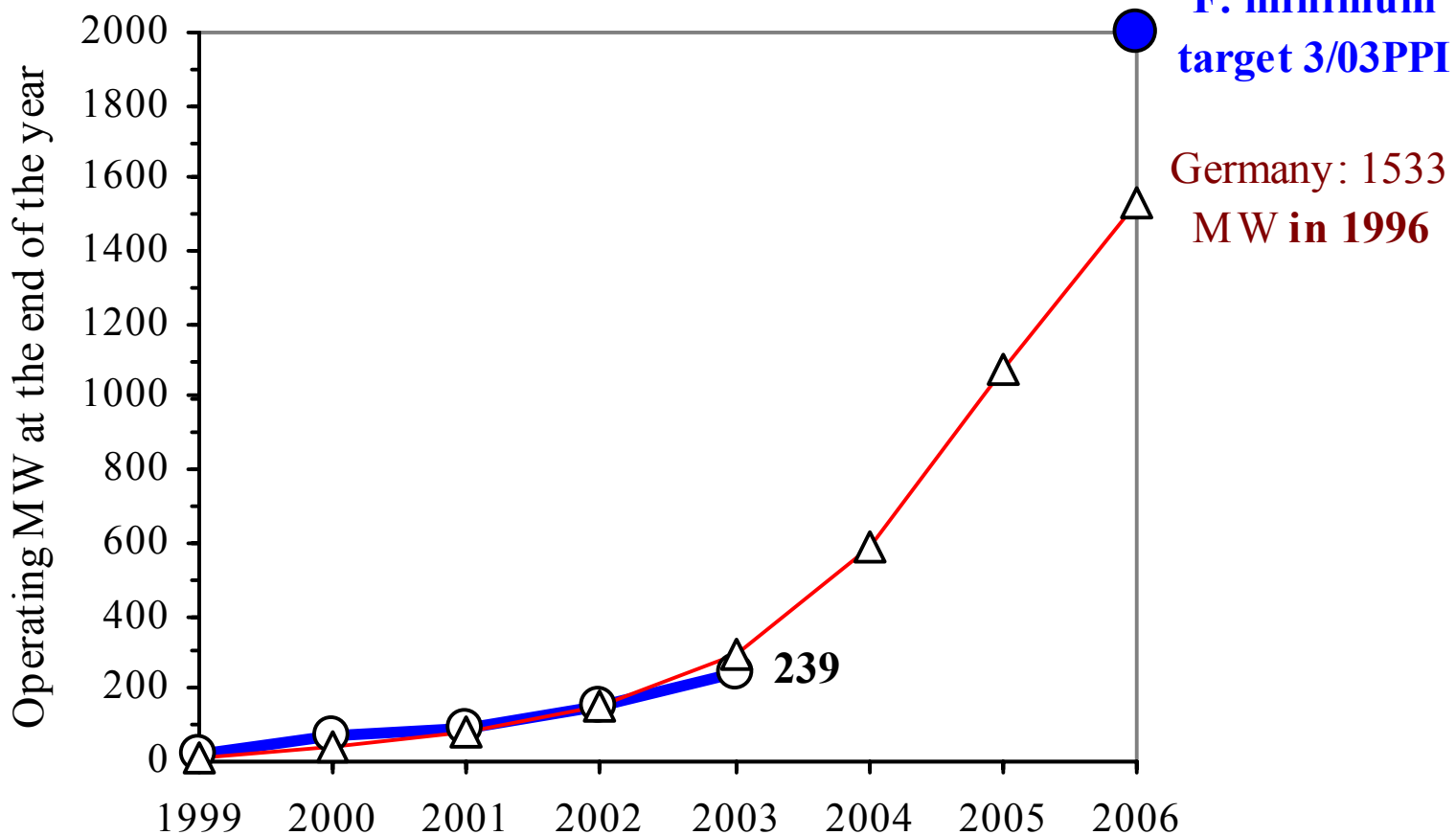
Location of the 15, 3 GW of application to EDF



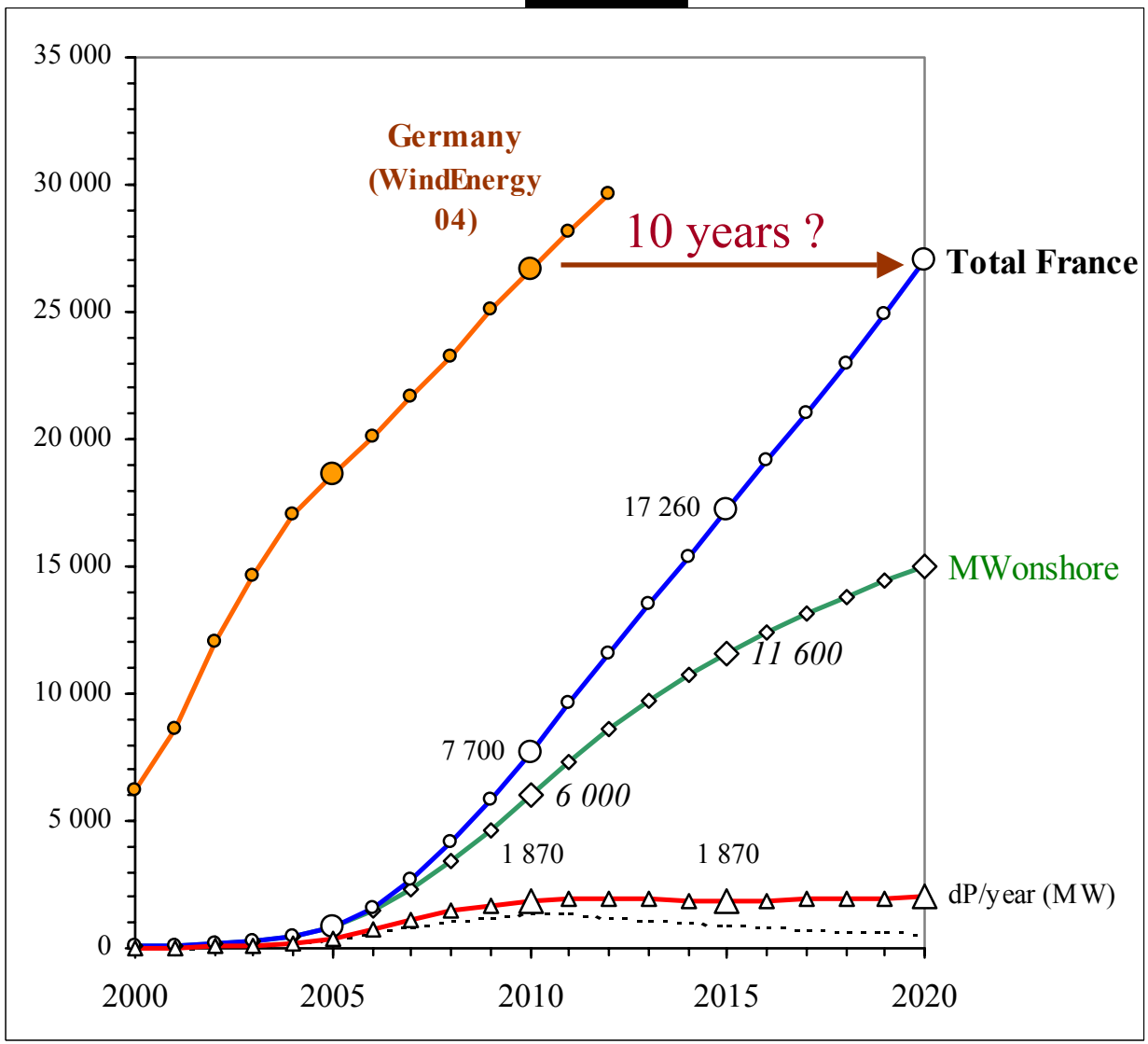
Source: data from EDF : http://www.edf.fr/index.php4?coe_i_id=14012
Note: definition af areas: EDF definition, does not fit to administrative regions

France: "only" ten years behind Germany ?

Comparing Germany : 1989-1996 & France: 1999-2006



Potential Wind Power Development up to 2020



Source: Germany: DEWI + WindEnergy04 ; France: B. Chabot, ADEME, Systèmes Solaires, mai-juin 2003, Paris

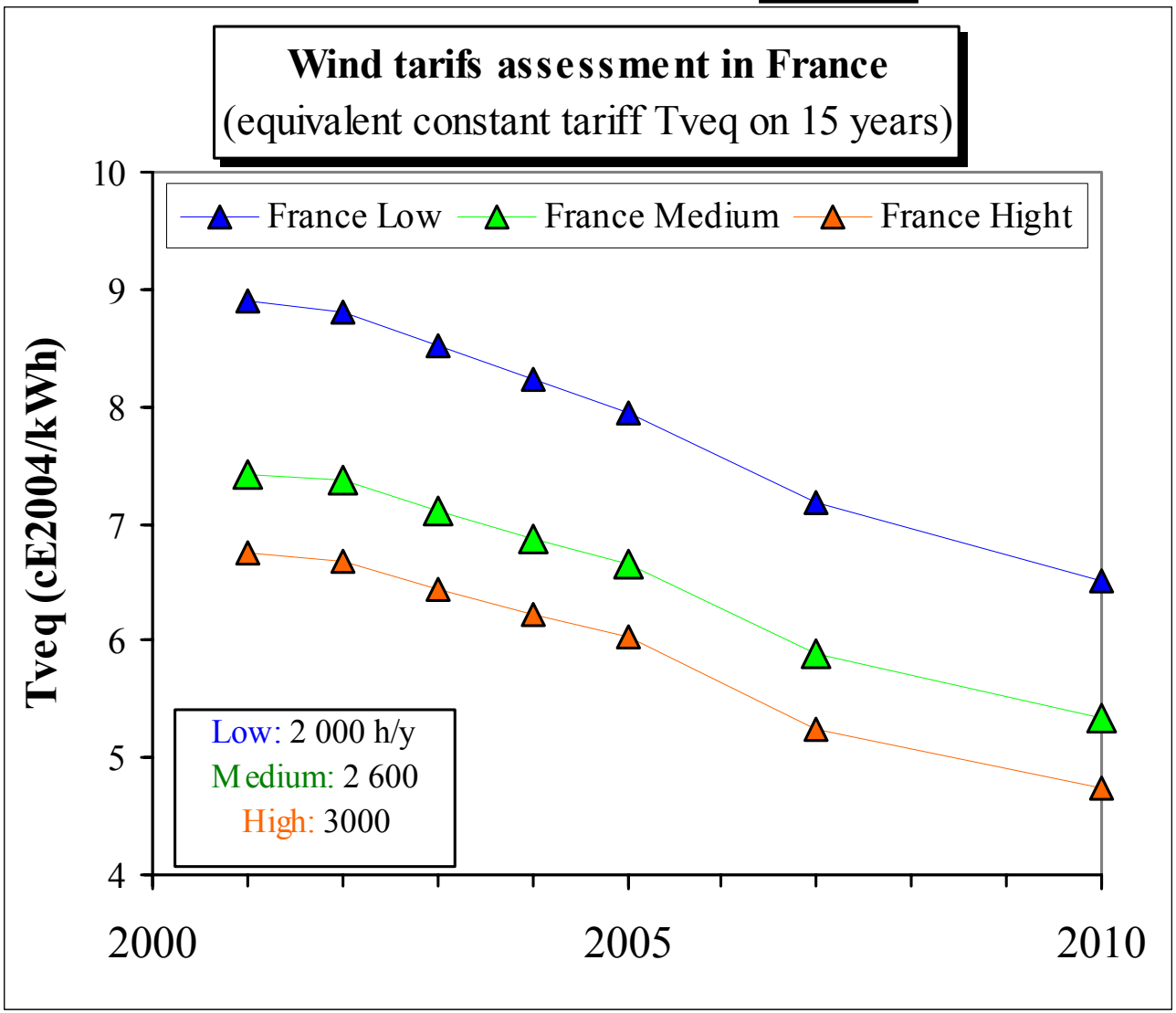
Part 3

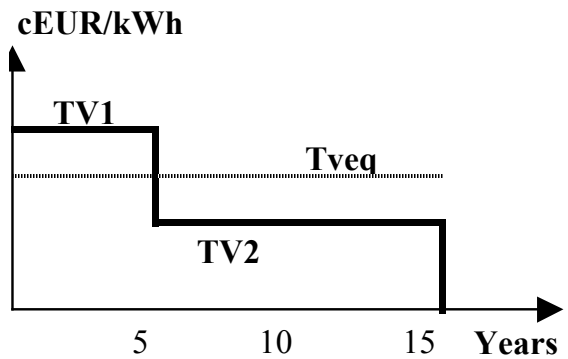
Investing in projects P < 12 MW

Investing in projects P < 12 MW (1)

- **Benefiting from guaranteed tariffs on 15 years**
- **Closest Wind Turbines from neighbouring different projects must be at a minimum distance of 1.5 km**
- **Building permit is mandatory (key step !) for all projects (h >12 m) and the letter from the "Préfet" announcing after application the necessary time frame for evaluation is mandatory to start the application for grid connection (RTE >20 KV, EDF-ARD < 20 kV)**
- **Complete EIA study if P > 2.5 MW ; simplified if P < 2.5 MW**
- **Public inquiry is mandatory for projects > 2.5 MW**
- **Status beyond the 260 MW already built end of march :**
  - ⇨> 15 000 MW of application files at RTE and EDF-ARD
  - ⇨250 MW to be build, already with their building permit
  - ⇨800 MW waiting for the Building Permit

Example of Tariffs Decrease (infl. rate: 2 %/year)

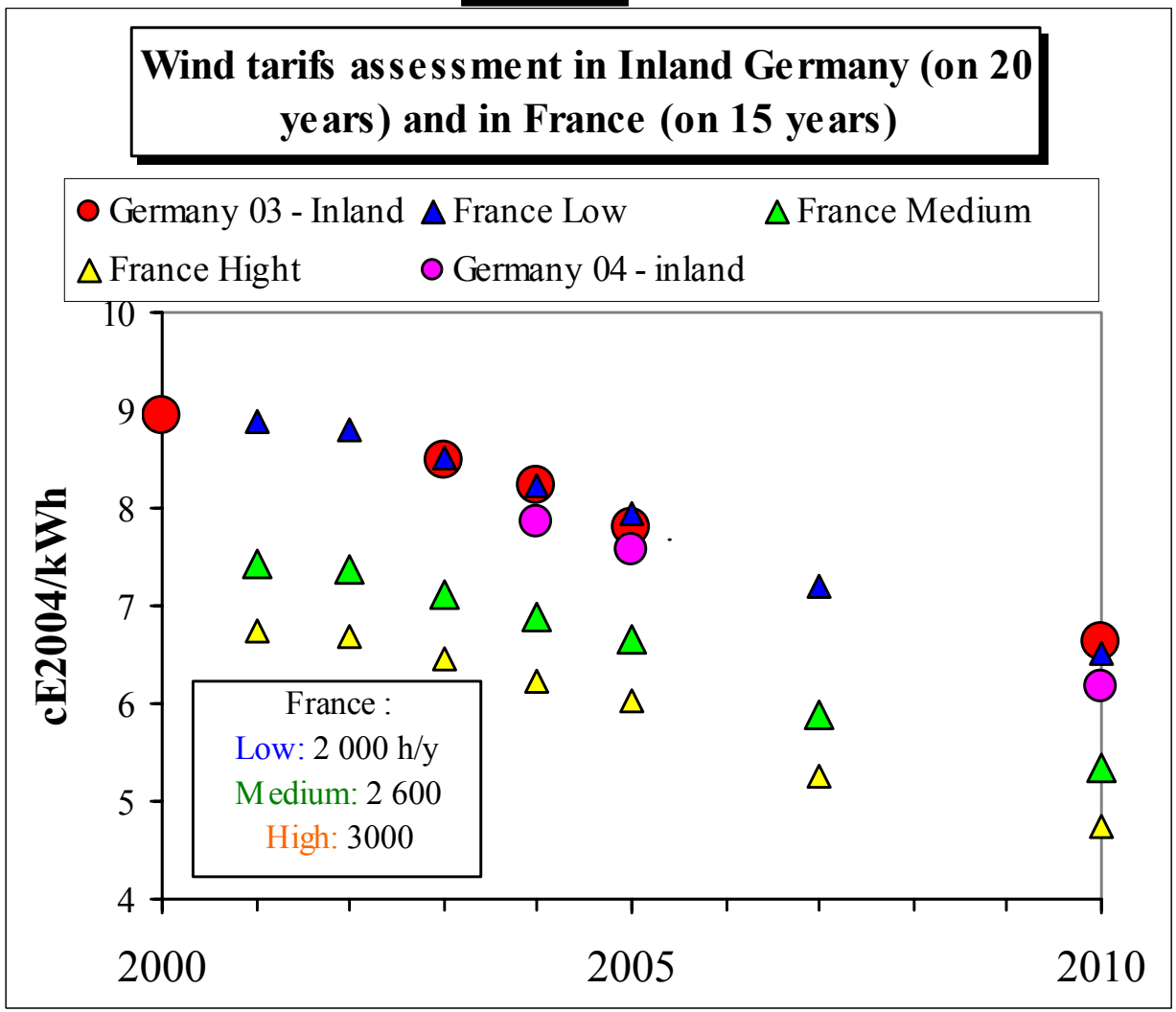




Note: actual tariffs may differ (ICHTTS and PsdA indexes may not vary as inflation rate, taken here at 2%/year)

Source: B. Chabot, ADEME, May 2004

Tariffs comparisons between Germany and France



Sources: Germany: "Old EEG": BWE 23/7/03 press release ; "New EEG": BWE in Wind Power Monthly 5/2004
France: B. Chabot – ADEME, May 2004

How to invest (2) : critical points

- **Finding available "favourable sites":**
  - ⇨Already 15 GW of applications
  - ⇨With 2001 tariffs: vast geographical zones to prospect (V > 6.2 m/s at hub height)
- **Building permit**
  - ⇨On September 10th 2003, 3 Ministers sent a letter to "Préfets" stating that "The target is to facilitate the fast implementation of wind projects" and detailing the up to date procedures
  - ⇨A large % of building permits are still contested in the courts
- **Grid connection:**
  - ⇨Up to 6 GW possible without public grid reinforcement
  - ⇨Delay (due to the number of applications : 15 GW)
  - ⇨Cost: underground lines standards and cost assessment from RTE and EDF-ARD

How to invest (3) : creating local acceptance

- **Good acceptance of wind power in the French public opinion, but active organisations against some projects**
- **Local municipalities should be implied in projects preparation and implementation**
- **High standards required for environmental solutions**
- **At the moment, projects are mainly from industrial developers, but room is open to:**
  - ⇨Projects open to local investors
  - ⇨Projects involving directly farmers
- **Advantages for developers strategies based on:**
  - ⇨Local economic activities
  - ⇨Partnerships and joint ventures with French partners for projects development, studies, financing, local manufacturing and works, operation and maintenance

Part 4

Investing in projects P > 12 MW

Two ongoing calls for tenders :

500 MW offshore:

proposals before August 13th 2004

500 MW + potential 500 MW onshore:

proposals before October 30th 2004

Common characteristics of calls for tenders

- **Managed by CRE, the energy regulatory authority:**
  - ⇨Texts and information are downloadable at: www.cre.fr (select: "Le marché", then "appels d'offres")
  - ⇨CRE will propose a non-public list of potential winners
- **The final winners list will be publicly announced by the Ministry of Industry before a specific date**
- **To be a winner doesn't give a legal advantage to get all requested authorisations, grid access and building permit**
- **Only one wind power project per site**
- **All wind plants must be put in industrial operation before a specific date defined in each call for for tender (A delay is possible only if accepted by the Ministry of Industry or if the list of final winners is published after a specific date ; the extension in this case is only based on the related delay)**

Common characteristics of the tenders (2)

- **All proposals must be complete, according to the list of the requested documents described in the text and in the annexes of the two calls for tenders**
- **A candidate must be an already created project company**
- **If selected, the candidate must operate the plant**
- **All proposals will be given a note (maximum : 20)**
  - ⇨The "Price" part of the note is maximum 12 (12 for the minimum price) ; The "Price" (in EUR/MWh) will be used for the power purchase contract (PPA)
- **During operation, forecast of production (at least for the following day) must be transmitted to the buyer**
- **All rights to use environmental advantages of wind kWh on derivative markets (green certificates, carbon credits…) are passed to the buyer of those kWh**

Specific characteristics for the offshore tender

- **Proposals to be sent to CRE before August 13th 2004**
- **Rated power for the call for tender: 500 MW**
- **Rated power for a single wind power plant:**
  - ⇨Minimum: beyond 12 MW ; **Maximum: 150 MW**
- **Minimum annual energy yield : Nho = 2200 hours/year ; If Nh < Nho, annual price value is multiplied by Nh/Nho**
- **Note (max: 20) for a project: maximum sub-notes are:**
  - ⇨"Price" (€/MWh): maximum **12** (for the lowest price)
  - ⇨Technical and financial robustness of the candidate: max: **3**
  - ⇨Environment impact dismantling capacity: maximum : **3**
  - ⇨Capacity to get acceptance from users of the local sea: **2**
- **Limit for the start of industrial operation and the PPA**
  - ⇨**Before January 1st 2007**

Specific characteristics for offshore tender (2)

- **End of the power purchase agreements :**
  - ⇨ **December 31st 2026**
- **Formula to link the "Price" to the inflation rate:**
  - ⇨ A fixed part of **50 %** of the "Price"
  - ⇨ The rest is related to two French "INSEE" official indexes already used for the tariff for projects under 12 MW
    - ✯ 30 % applied to the Index related to the cost of manpower
    - ✯ 20 % applied to the Index related to the cost of industrial goods and services

Specific characteristics for the onshore tender

- **Proposals to be sent to CRE before October 30th 2004**
- **Rated power for the call for tender: 1000 MW = sum of:**
  - ⇨A firm "Part 1" : 500 MW, plus an optional "Part 2" : 500 MW
- **Rated power for a single wind power plant:**
  - ⇨Minimum: beyond 12 MW ; Maximum: not specified
- **Note (max: 20) for a project: maximum sub-notes are:**
  - ⇨"Price" (€/MWh): maximum **12** (for the lowest price)
  - ⇨Technical and financial robustness of the candidate: max: **2**
  - ⇨Environment impact and local acceptance: maximum : **4**
  - ⇨Power: maximum : **2** (for the greatest rated power)
- **Limit for the start of industrial operation and the PPA**
  - ⇨"Part 1" : before January 1st **2006**
  - ⇨"Part 2" : before January 1st **2007**

Specific characteristics for onshore (2)

- **End of the power purchase agreements :**
  - ⇨December 31st 2021 if the candidate is selected before November 1st 2004 (*Note: from the present text of the call for tender, may be an error on this 2004 date)*
  - ⇨December 31st 2022 if the candidate is selected before November 1st 2005
- **Formula to link the "Price" to the inflation rate:**
  - ⇨A fixed part of **70 %** of the "Price"
  - ⇨The rest is related to two French "INSEE" official indexes already used for the tariff for projects under 12 MW
    - ✯20 % applied to the Index related to the cost of manpower
    - ✯10 % applied to the Index related to the cost of industrial goods and services

Some information sources

- **Ministry of Industry (in charge of Energy) (http://www.industrie.gouv.fr/cgi-bin/industrie/frame0.pl?url=/energie/sommaire.htm)**
- **Energy Regulatory Authorithy: CRE : www.cre.fr**
- **ADEME (www.ademe.fr)**
- **RE Industry Association: SER (www.ser-fra.com)**
- **National Wind Energy Association: France Energie Eolienne (http://www.fee.asso.fr)**
- **Grid operators:**
  - ⇨Transport (P > 12 MW): RTE : http://www.rtefrance.com
    - ✯For grid access process : http://www.rtefrance.com/htm/fr/offre/offre_raccord_prod.htm
  - ⇨Distribution : EDF: http://www.edf.fr
    - ✯For grid access: http://www.edf.fr/index.php4?coe_i_id=159
- **Invest In France Agency:** www.investinfrance.de
- **Deutsch-Französische Industrie und Handelskammer:**
  - ⇨www.deutschfranzoesisch.com

Conclusions

- **Wind power represents the bulk of new power to be built to apply in France the EU directive on renewables**
- **The French tariff system gave a sufficient impetus for projects portfolios (> 15 GW at P < 12 MW end of 2003)**
- **Problems to get in time sufficient number of building permits & grid access not yet solved: time, energy, local dialogue and partnership still necessary for each project**
- **New opportunities for the two 2004 calls for tenders :**
  - ⇨500 MW offshore
  - ⇨500 + (500 MW) onshore
- **Foreign investors and projects developers are welcome, especially if they implement French and local partnerships and joint activities.**