VINDKRAFTCENTRUM

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Basic points

- Introduction: The big picture, ambitions of the region, the Barents area
- Strengths and challenges for Northern Sweden.
- Possibilities for companies in the region
- Own reflections

Global challenges:

- Reduce energy consumption
- From coal and oil to renewable energy (China doubled its wind power production under 2009!)

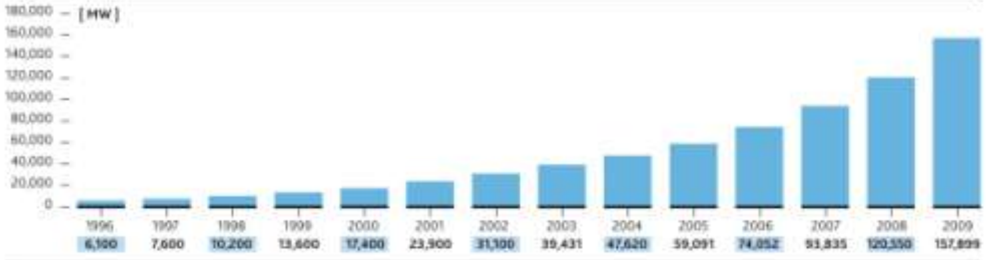
Europe's and Sweden's ambitions for 2020:

- EU energy consumption to be reduced by 20 %
- At least 20 % of energy shall be renewable
- Proportion of electricity from wind power in Sweden shall be 20 TWh by 2020 (3 TWh 2009)

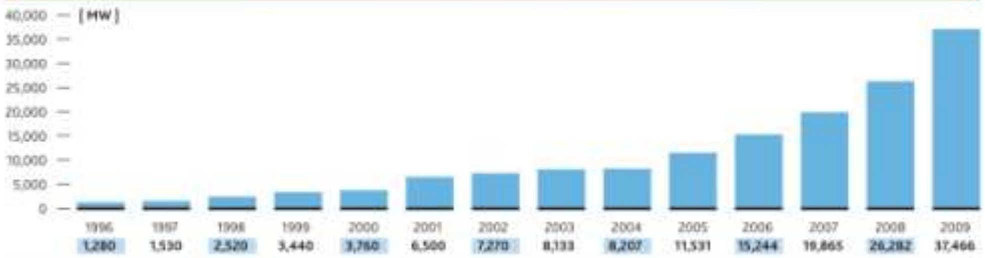
Strong regional ambitions within the energy area

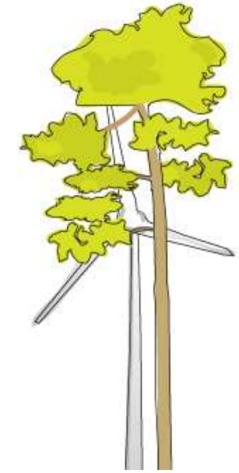
- Wind power, environmental fuels, biogas, biofuel, energy efficiency, etc.

GLOBAL CUMULATIVE INSTALLED WIND CAPACITY (1996-2009)



GLOBAL ANNUAL INSTALLED WIND CAPACITY (1996-2009)

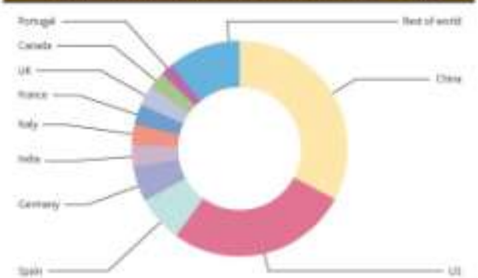




TOP 10 CUMULATIVE CAPACITY DEC. 2009

	MW	%
US	35,159	22.3
Germany	25,777	16.3
China	25,104	15.9
Spain	19,149	12.1
India	10,926	6.9
Italy	4,850	3.1
France	4,492	2.8
UK	4,051	2.6
Portugal	3,535	2.2
Denmark	3,465	2.2
Total top 10	**136,508**	**86.5**
Rest of the world	**21,391**	**13.5**
World total	**157,899**	**100**

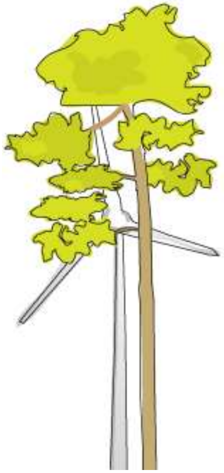
TOP 10 NEW INSTALLED CAPACITY JAN.-DEC. 2009

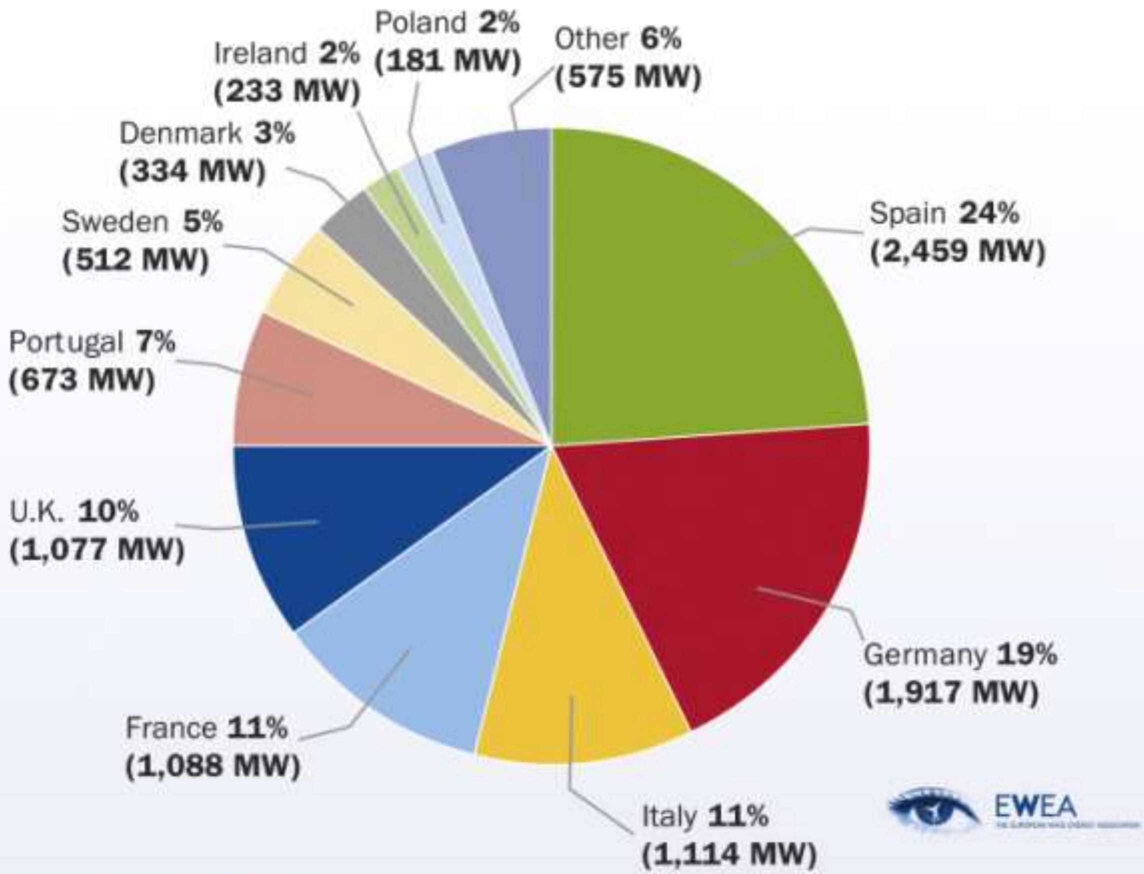


	MW	%
China	13,000	34.7
US	9,922	26.5
Spain	2,459	6.6
Germany	1,917	5.1
India	1,271	3.4
Italy	1,114	3.0
France	1,088	2.9
UK	1,077	2.9
Canada	950	2.5
Portugal	673	1.8
Total top 10	33,471	89.3
Rest of the world	**3,994**	**10.7**
World total	**37,466**	**100**

EU MEMBER STATE MARKET SHARES FOR NEW CAPACITY INSTALLED DURING 2009. TOTAL 10,163 MW

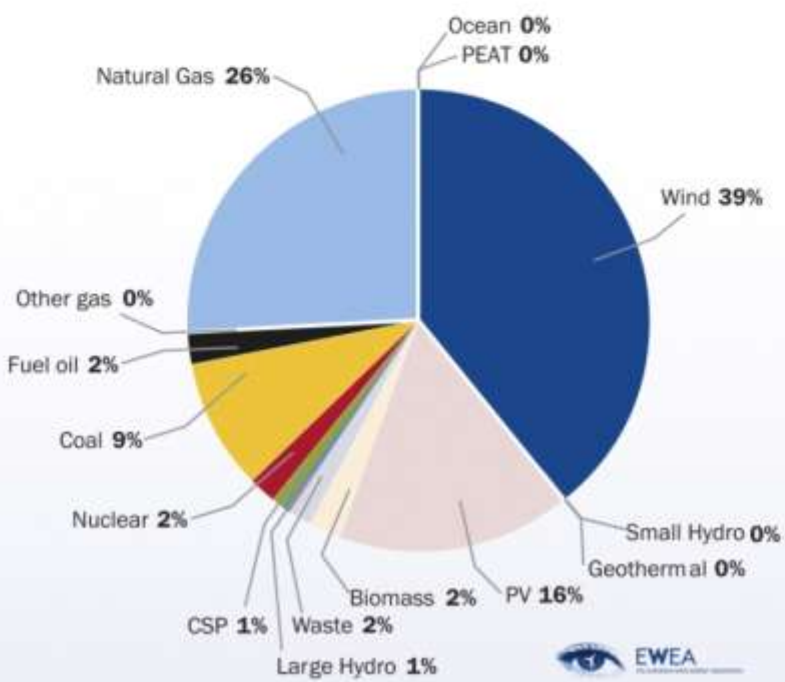
FIGURE 1.1



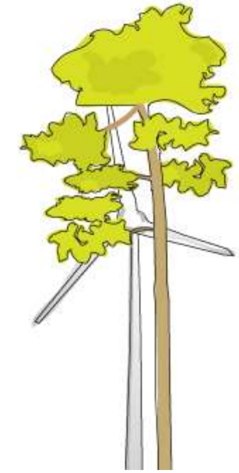


Source: EWEA, EPIA, ESTELA, EI-OEA, and Platts Powervision

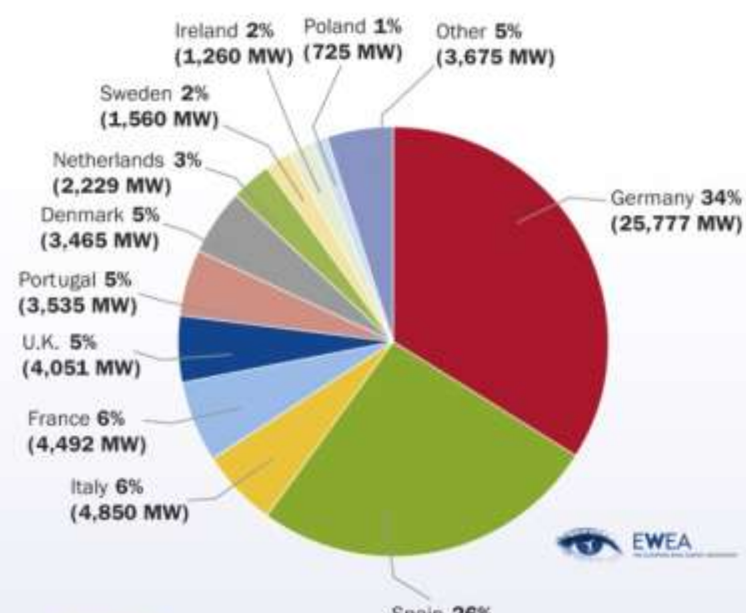
SHARE OF NEW POWER INSTALLATIONS IN EU FIGURE 1.3



Source: EWEA, EPIA, ESTELA, EI-OEA, and Platts Powervision



EU MEMBER STATE MARKET SHARES FOR TOTAL INSTALLED CAPACITY (2009). TOTAL 74,767 MW FIGURE 3.4



Source: EWEA

Planned land-based Wind power in the Barents region

Northern Norway

Finnmark	3117 MW
Troms	1352 MW
Nordland	4188 MW

Northern Sweden

Norrbotten	5000 MW
Västerbotten	3000 MW
Jämtland	3458 MW
Västernorrland	1500 MW

Northern Finland

Lappland	1500 MW
Kajanland	10 MW
N. Österbotten	2000 MW

25,000 MW within the Barents region:

- **Expedite transition to renewable energy!**
- **10,000 new jobs in the wind power industry!**

  (compare with Markbygden)
- **New business opportunities for companies!**

25,000 MW within the Barents region:

- **Strengthened research!**
  (Wind power in cold climates)
  (Wind power in forestry environments)

- **New education!**

- **Conferences and new knowledge!**

Northern Norway

- High wind strength on land and at sea.
- Money and compenetce: Statkraft, Statoil etc.
- Infrastructure not adapted (transfer network)
- Opinion against wind power

Northern Finland

- Guaranteed lowest-price system
- Manufacture of wind power generators (Winwind)
- Oulu and Vasa.
- Nuclear power – Wind power?!

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Norrbotten and Västerbotten - strengths

- High competence within the energy area

  - Energy producers: Vattenfall, Luleå Energy, Skellefteå Kraft, etc.

  - Consumers: Basic industry

  - Luleå University of Technology

- Many developers within the region

- Great interest from external developers to establish in the region.

Norrbotten and Västerbotten - strengths

- Competence centre at Luleå University of Technology.
- New education, e.g. for Wind power technicians in Piteå - starting autumn 2011.
- Relatively few land owners, relatively few conflicting interests
- STRONG INVOLVEMENT!

Norrbotten and Västerbotten - challenges

- *Everyone wants to know how our energy supply system will be by 2020 in order to make plans. Unfortunately, this is impossible! "Successive planning"*

- Expansion of transfer capacity

- Other infrastructure projects (harbours, roads, mining, etc.)

Norrbotten and Västerbotten - challenges

- Uncertainty concerning the influence of price areas
- Uncertainty concerning the value of electrical-certificates. Lowest value?
- Profitability (low electricity prices, uncertainty concerning price areas and trading of electrical certificates.)

Norrbotten and Västerbotten - challenges

- Recruiting a competent work force.
- Education input at the right time
- Uncertainty concerning the armed forces (40 km radius, radio links, etc.)

Attitude of the municipalities (1)

- "How can the municipalities **be economically compensated** for the **intrusion** that the planned wind power establishment implies?"

- Fear and uncertainty, new and hard to understand
- Not consulted, uncertain
- Demanding

Attitude of the municipalities (2)

- “How can the municipality **develop** as a result of the planned establishment?”

  - New job opportunities, short and long term
  - New education
  - New research
  - Conferences, seminars
  - National economic calculation

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Companies that wish to enter the branch

- Packaging of own business/network
- Contact developers within the region. (large, small, public, private)
- Contact turbine manufacturers

Companies that wish to enter the branch

- Contact “Näringslivets vänner” (Friends of the business world)
- Contact your partners that are already “in the system”.
- Visit exhibitions/events

Markbygden - key figures

- 500 jobs during the construction phase
(earthwork/installation work, assembly of 100 generators/year.)

- 250 permanent jobs within operation and maintenance
(electricians, service personnel, road maintenance, etc.)

- 250 jobs at the concrete factory on Haraholmen

- Consequential affects. (consultants, hotels, service, tourism, etc.)

Markbygden – key figures

- 500 km of new roads within the area
- 1,500 tons of concrete per foundation (x 1,100)
- 50-70 tons of reinforcing bar per foundation (x 1,100)

Developers – Norrbotten

• Vindkompaniet	Övertorneå
• Denitia	Haparanda
• Arctic Windpower	Kiruna
• Kjell Werner Jensen	Piteå
• Göran Eriksson Maskintjänst	Kalix
• Kalix Vindkraft	Kalix
• Global Green Energy	Piteå
• Skellefteå Kraft	Arjeplog
• Dragaliden Vind	Piteå
• Suorvavind	Jokkmokk
• Vindkompaniet Mörbylånga	Luleå

Developers – Norrbotten

- Markbygden Vind — Piteå
- Luleå Energy — Luleå
- Kraftö Vind — Piteå
- Klocktärnan — Piteå
- Ventovarium — Luleå, Haparanda
- Vindkompaniet — Kiruna, Arvidsjaur
- Vindin AB — Gällivare
- Öström Vind — Piteå
- Vattenfall Vindkraft — Jokkmokk, Gällivare

Developers – Västerbotten

- VindGruppen Storuman
- Petlandskär Vind / Nordanvind Umeå
- TCC Åsele
- Fred Ólsen Renewables Vindeln, Umeå/Robertsfors, Vilhelmina, Storuman
- Nordanvind Skellefteå, Storuman
- Nordisk Vindkraft Malå, Lycksele
- Slite Vind Umeå
- VindIn Ö-vik
- Kraftö Umeå
- Vattenfall Sorsele, Stor-Rotliden

Developers – Västerbotten

• Kraftö Vind	Robertsfors, Nordmaling
• GHG Bostäder	Vilhelmina, Storuman
• Holmövind	Umeå
• RenVind AB	Malå
• Stefan Widén	Robertsfors
• Skellefteå Kraft	Storuman, Malå
• Umeå Energy	Umeå
• GiroVind Energy	Skellefteå
• Gabrielsberget Vind	Nordmaling
• Åsele kKraft	Åsele

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Conclusions/success factors

- A new branch of industry is developing. (research, education, work opportunities, infrastructure, etc.)

- Social structure project – lift your eyes from your own activity!

- A *part of the work* with the climate challenge. Avoid “heaven and hell” discussions

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Conclusions/success factors

- Parties with different interests treat each other with respect.

- The potential for the region is enormous!!!

- ***Hard work with our challenges is the key to success! Good relations is another!***

If you wonder about anything or want to discuss ideas, don't wait; contact us immediately!

Stefan Lundmark: 0911-697044
Jonas Lundmark: 0911-697048
Anna Marklund:0911-697047
www.vindkraftbarents.se

Many thanks for your interest!

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Sponsors

En investering för framtiden

EUROPEISKA UNIONEN
Europeiska regionala utvecklingsfonden

Piteå Kommun
Tillväxtavdelning

Energimyndigheten

NORRBOTTENS LÄNS LANDSTING

Länsstyrelsen Norrbotten

The idea behind the Wind power centre

- WC shall **facilitate the advent** of the planned wind power investments in Piteå and the region.

- WC shall **maximize the benefit** of the development. (new job opportunities, conferences/seminars, stimulate new research and initiate education)

- WC shall contribute to the creation of **500 new jobs** within the region by 2020.

- By 2013, WC shall be considered as **a focal point for wind power development** in Northern Sweden.

Local focus for Wind power centre

- Planning for expansion of Piteå harbour.
- Planning for establishment of the concrete factory.
- YH (professions college) education, high school.
- How do we maximize participation of the region's businesses?