

Wind power development in Sweden

Overview of the policy context and investor groups

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Some relevant facts about Sweden



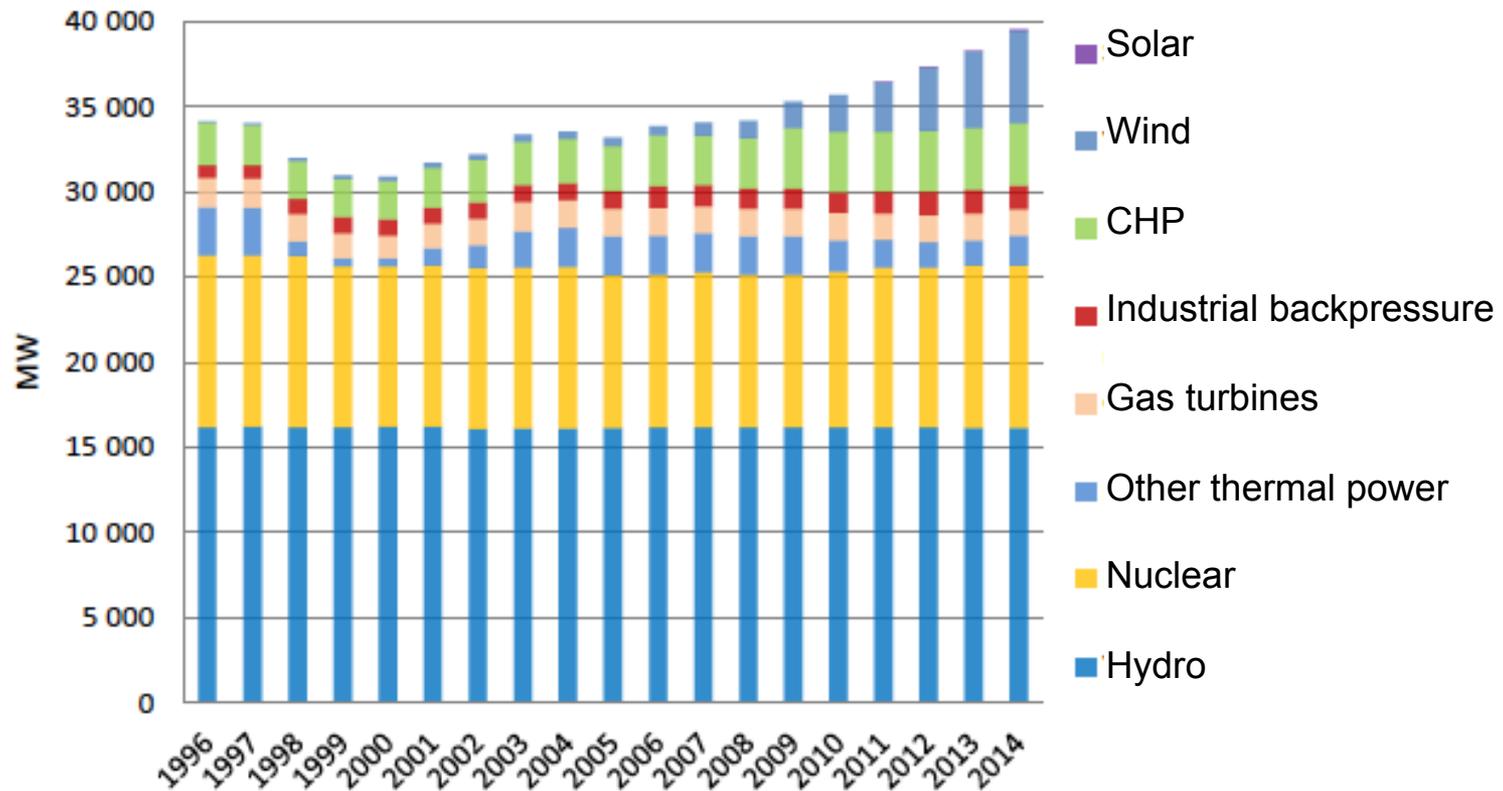
- Situated in Northern Europe, Scandinavia
 - A rather large country
 - Only 3% of the land area is built up and forests cover 69% of the country
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- 10 millions inhabitants, mostly gathered in the South
 - Good economy
 - Sweden has come out relatively unscratched from the financial crisis



The energy context

1. Share of RE production is among the highest in Europe.
2. The baseload supply comes from hydro- and nuclear power.
3. Aging nuclear plants.
4. The market is liberalized since 1996.
5. A few very large electricity consuming industry (e.g. pulp and paper, metal and steel).
6. Low electricity prices (compared to the rest of Europe). In Feb 2017: Stockholm c€13,52/kWh, Berlin c€29,44/kWh, Paris c€17,11/kWh, Rome c€19,22/kWh

Installed production capacity



Source: The Swedish Energy Agency (2016)

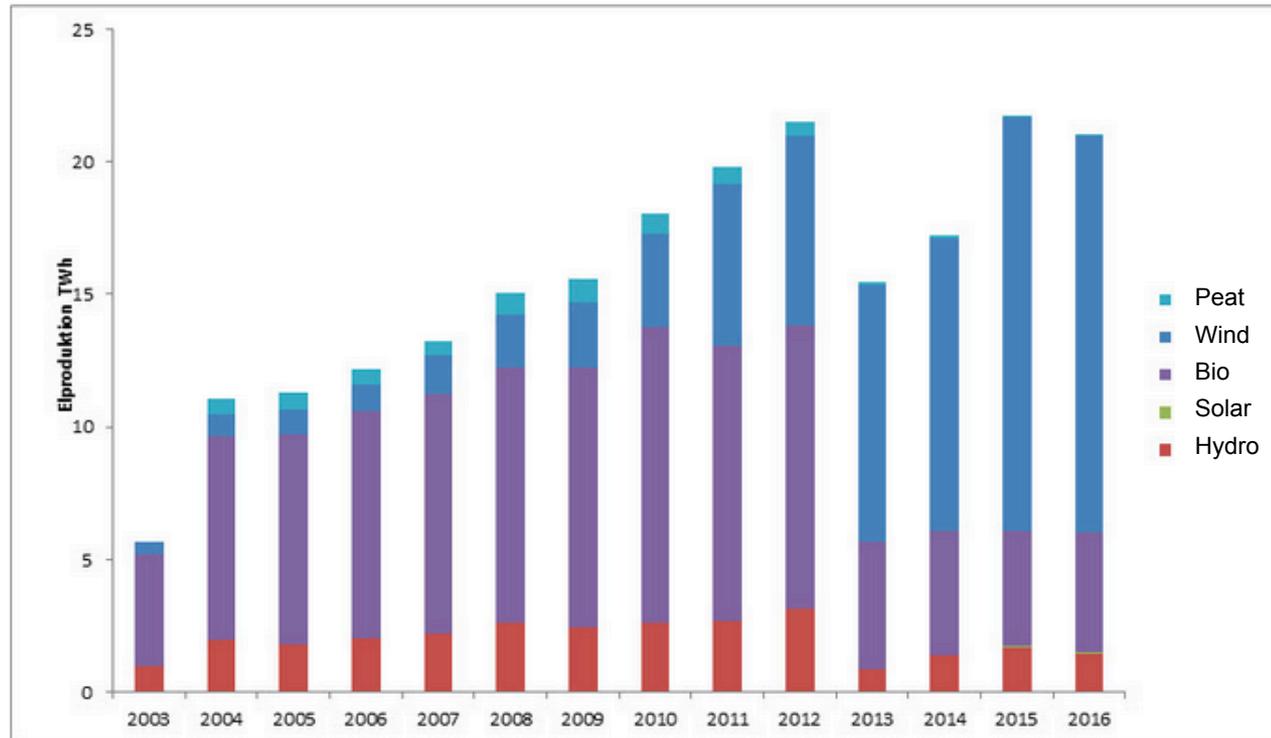
Energy policies

1. In theory, anyone can produce and sell electricity on the electricity market (Nordpool).
 2. The two last governments have not taken any stand-point with regard to nuclear power... but they have not agreed to participate or subsidize the financing of new plants.
 3. The main incentive policy is the Tradable Green Certificate system (since 2003 - before that, investment subsidies). For solar power, there are additional investment subsidies.
 4. Common Tradable Green Certificate with Norway
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A few words about the TGC system

1. For every MWh produced yearly, during a period of 15 years from the year of the investment, renewable electricity producers are granted a green certificate.
2. Electricity suppliers must buy certificates corresponding to a certain quota of their total electricity sales or consumption.
3. Presented as a cost-efficient market-based policy.
4. Since its creation in 2003, TGC prices have gone up and down (e.g. CHF 19 in 2006, CHF 33.5 in 2010... and CHF 8 in February 2017).

A few words about the TGC system



Renewable electricity production in Sweden within the TGC-system 2003-2016, based on the number of granted certificates

The siting process

Middle-size plant

1. 1 turbine (>50m)
2. 2 or more turbines at the same location
3. Municipalities deal with the permit application. They can emit a veto – no explanation needed.

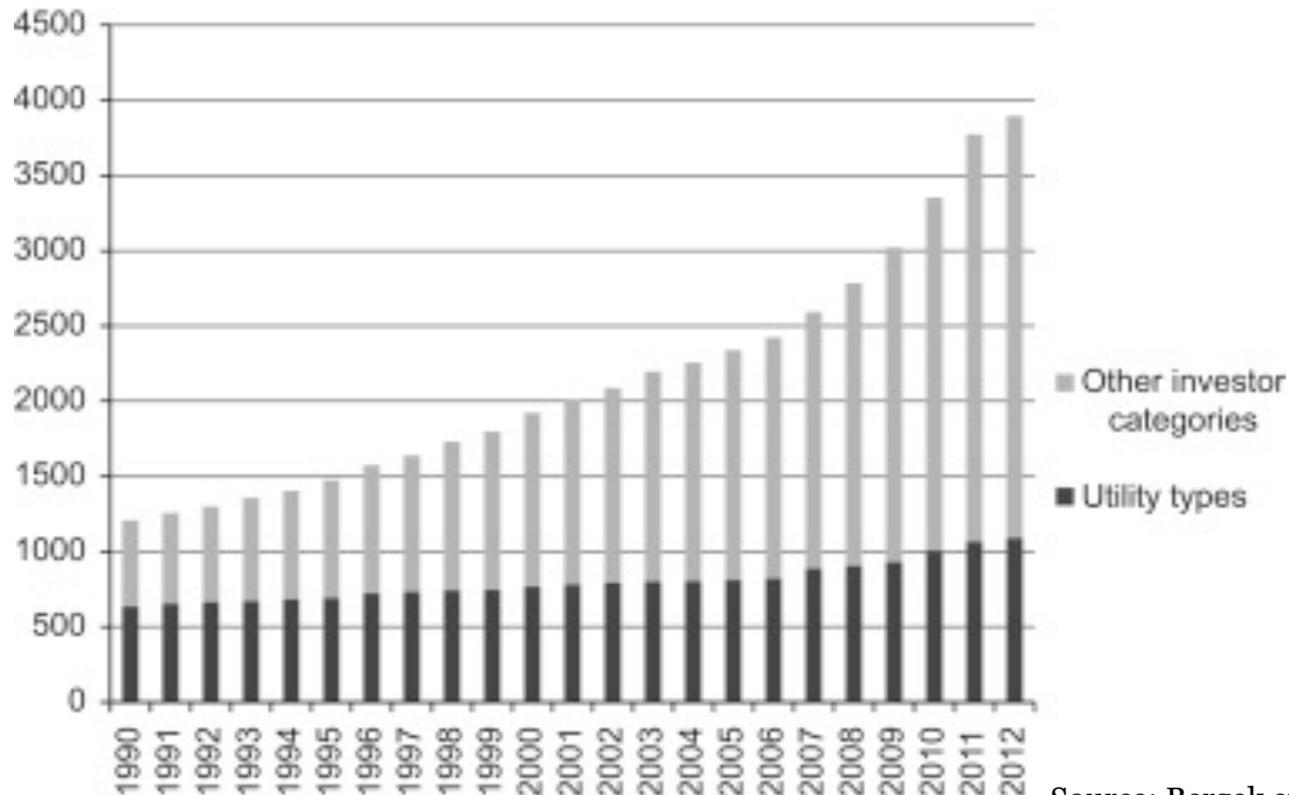
Large plants

- 7 or more turbines of > 120 m
- All groups of >150m turbines
- Municipalities still can emit a veto, but the regional councils are the ones dealing with the permit application.

The siting process – main challenges (from the perspective of project developers)

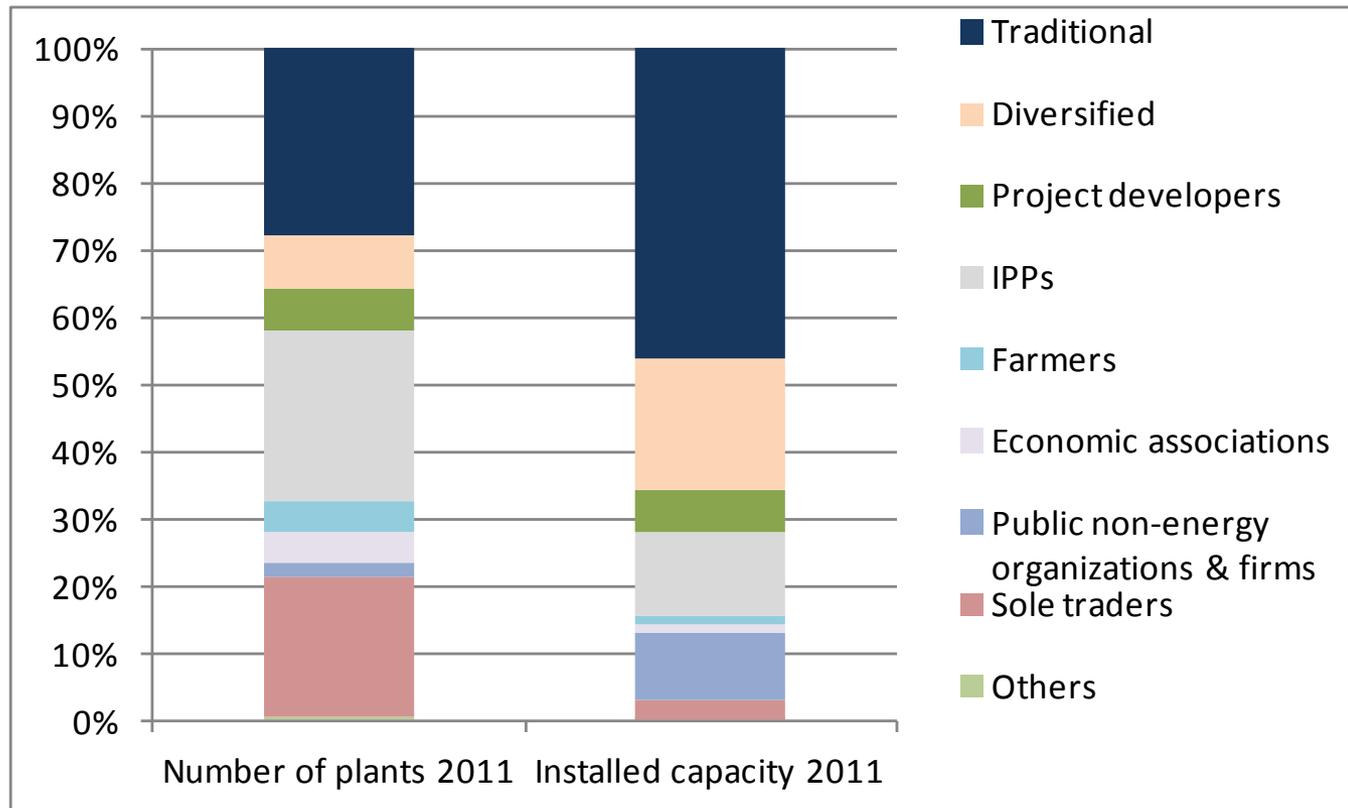
1. Lack of transparency of the siting process
2. Lack of knowledge of municipalities and regional councils (both politicians and officials)
3. Professionalization of lobby/interest groups in addition to the national protection agencies
4. Power imbalance?

Who invests in renewable electricity production in Sweden?



Source: Bergek et al. (2014)

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What characterizes these investors?

1. Most of them come from different sectors than the energy sector.
2. Most of them have very limited prior experience and knowledge of renewable electricity (e.g. the technology, its implementation, policies, the energy market, etc.).
3. They have different motives for investing: image, legitimization, cutting costs, generating rents, the environment, an interest in the technology, etc.
4. They have their own "rationality" for the design of the investment.

Introduction to the experiment

Due to the lack of prior experience and knowledge, many investors hire project developers for their projects.

This is not completely problem-free!

- On the one hand, investors have their own "rationality" for the investment => risk of mismatch with the project developers' recommendations.
- On the other hand, there is a risk of power imbalance between (expert, but also business-orientated) project developers and their clients.

Thank you for your attention!

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Choice experiment

1. Carefully read the handout
2. Go to

<https://intermediaries.sawtoothsoftware.com/login.html>

1. Before the experiment starts, are there questions?
2. Do the experiment
3. Results will be presented soon

6 thinking hats exercise

1. Swiss context: KEV phase out?
2. Different types of policies:
 - Subsidies
 - Regulations
 - Simplify and speed up permitting
 - Policy package
3. 3 groups evaluating policies from the viewpoint of:
 - Wind project developer
 - Society
 - Politicians