Distributed energy in Finland – why energy should be generated nearby?

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Finland is called 'the land of the thousand lakes.
The large areas of forest cover almost two thirds of the land mass.

Check: http://www.visitfinland.com
What are the Finns like?

Finnish joke: “When talking with you; an introverted Finn looks at *his* shoes, and an extroverted Finn looks at *your* shoes”.

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Aalto University
School of Business
Finns & energy

Energy consumption 1970-2013

- Fossil fuels
- Peat
- Renewables
- Nuclear energy
- Others

Statistics Finland / Energy consumption
Appendix figure 4. Renewable energy sources 1970–2013

Source: Energy supply and consumption, Statistics Finland
Finland has high share of renewables
Fully renewable energy system is economically viable in Finland in 2050

LAPPEENRANTA UNIVERSITY OF TECHNOLOGY

A fully renewable energy system, including all energy consuming sectors, is not only a possible but a viable solution for Finland, according to a new research. Researchers from Lappeenranta University of Technology (LUT) have investigated renewable energy system options for Finland in 2050. Results indicate that a fully renewable energy system is possible, and represents a competitive solution for Finland with careful planning.

In order to achieve the national greenhouse gas reduction targets for 2050, all sectors of the energy system need to be nearly emission free by 2050. Renewable energy system modelling
A 100% renewable energy system seems possible for Finland, given the assumptions made in this study.

The 100% RE scenarios are highly cost competitive.

High level of energy independence seems achievable.

Prominent roles of renewable energy and energy storage solutions should be considered in all future modelling.

Opportunities exist for increased domestic investment and RE-based employment.

Flexibility should be a defining feature of future energy systems.

100% RE should be an equal partner in all future discourse regarding the Finnish energy system.

Further study is needed related to how people will choose to live, how they will perceive risk and the role of energy in their lives (Futures Research) in order to hone the technical requirements of the energy system used in modelling.
Renewable energy is mostly bioenergy

New renewable energy technology adoption is low
Geothermal, solar, and wind energy as newcomers
How much of the renewable energy is produced onsite or nearby in Finland???
Challenges

- “Big is beautiful” culture
- New solutions and technologies -> uncomfort zone and fear of failure
- Carbon price is not seen as risk
- Cheap energy
- Lack of political interest and economical incentives for citizens’ energy investments
Comparison of solar PV support policies between Finland, UK, Belgium and South Korea

<table>
<thead>
<tr>
<th>Country</th>
<th>Support policy small scale</th>
<th>Support policy large scale</th>
<th>Installed capacity</th>
<th>Market growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>Exemption from grid fees and taxes for self consumption</td>
<td>Investment aid 30%, exemption from grid fees and taxes up to 100 kVA or 800 MWh</td>
<td>Approx. 6 MW (2014)</td>
<td>slow</td>
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<tr>
<td>UK</td>
<td>Feed-in-Tariffs</td>
<td>Renewables Obligation</td>
<td>4979 MW (2014)</td>
<td>fast</td>
</tr>
<tr>
<td>Belgium</td>
<td>Net-metering</td>
<td>Capital subsidies, income tax credits</td>
<td>3008 MW (2013)</td>
<td>fast</td>
</tr>
<tr>
<td>South Korea</td>
<td>Home Subsidy Program</td>
<td>Renewable Portfolio Standard</td>
<td>1555 MW (2013)</td>
<td>average</td>
</tr>
</tbody>
</table>
Finland offers the cheapest electricity in Europe

Posted on 30.05.2013 by IIF

Finland has the cheapest electricity prices in the European Union for industrial and household consumers, and the trend is towards still lower prices, according to the latest figures published by Eurostat.

The price of electricity (including taxes) for industrial consumers in Finland was EUR 0.0915 per KWh during the second semester of 2012. This was about 38% lower than the EU27 average of EUR 0.1466 per KWh. The price of electricity for industrial consumers in Finland fell slightly during the second semester of 2012 compared to the corresponding period in 2011.

Finnish households benefit

According to Eurostat, the price of electricity for household consumers in 2012, while in Finland it fell by 1%. In absolute terms, the price of electricity in Finland was about 21% cheaper than the EU27 average.

“The Energiewende is a big democratic project”

Encouraged by federal legislation such as the Renewable Energy Act, the governments of many German states have worked hard to make the Energiewende a success, as well as a business opportunity for their citizens.
Opportunities

• Energy efficiency and renewable energy can improve trade balance
  • Finland’s energy imports cost annually 8.5 billion euros (approx. 4 % from GDP), mostly fossil fuels from Russia

• transition to renewable energy can create 50,000 new jobs by 2030
  • economical crisis and 280,000 unemployed people

• New source of income and jobs for local communities, especially in rural areas

• Cleantech export potential
Facts & Figures about Finnish Cleantech

Finland is a leading cleantech nation with a booming cleantech business sector and serious public-sector support for the industry. Here are a few select facts and figures.

<table>
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<th>STATISTICS</th>
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<td><strong>€24.6 billion</strong></td>
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<td>Combined turnover for Finnish cleantech business in 2012</td>
</tr>
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</table>
Renewable energy benefits local economy

- 320,000 houses are heated with oil or electricity. If they would change to ground heat pumps, that would create employment equivalent of 1,500 work years and it would improve Finnish trade balance by 260 million euros.

- Kuopio Energy case: If coal would be replaced by bio, the city and regional companies involved in bioenergy value chain would benefit 6.2 million euros more in yearly basis. Bio would create 3 times more jobs than coal.
”Do it yourself” energy fosters user innovation and new business creation
Prosumers participate in the creation of products in an active and ongoing way

- Creativity meets consumption
- Peer collaboration
- Co-creation of product ideas and improvements
The rise of inventive energy users


- 330,000 posts
  - some of the messages were read 80-100 million times
- Technology inventions or modifications made by users:
  - 113 related to heat pumps
  - 87 related to pellet heating systems

Energy policy perspectives

New government programme:
+ increasing heating oil taxes
+ phasing out coal in 2020’s
- R&D cuts
- Cutting wind power feed-in-tariff

? Investment subsidies
Citizens in the energy market – threat or positive opportunity for Finland?
Thank you!

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FinSolar Project www.finsolar.net
References


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