Security of supply - Winter outlook for Finland

Montel’s Finnish Energy Day 2023
Helsinki
Happened last year...
Winter 2022-2023 capacity balance

<table>
<thead>
<tr>
<th>Cold winter day once in ten years</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Generation</td>
<td>12 900 MW</td>
</tr>
<tr>
<td>Peak demand</td>
<td>15 100 MW</td>
</tr>
<tr>
<td>Balance</td>
<td>-2 200 MW</td>
</tr>
<tr>
<td>Import capacity</td>
<td>3 400 MW</td>
</tr>
<tr>
<td>- Sweden</td>
<td>2 400 MW</td>
</tr>
<tr>
<td>- Estonia</td>
<td>1 000 MW</td>
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</tbody>
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Three points
- Olkiluoto 3
- Sweden
- Weather
"Nose on the surface!"

- Temperature -25 °C
- Almost calm

Oikiluoto 3 1600 MW
Wind generation 300 MW

2200 MW import from Sweden

Peak demand 15 100 MW

"Breathe freely again!"

- Temperature -17 °C
- Moderate wind

Oikiluoto 3 1600 MW
Wind 1400 MW

Peak demand 14 000 MW

"Houston, we have a problem!"

- Temperature -25 °C
- Calm weather

Oikiluoto 3 offline
No wind generation

1500 MW import from Northern Sweden

Peak demand 15 100 MW

- Saving during December 2022 peak hours 1300 MW
- "Voluntary support system" 500 MW
# What happened?
## Winter 2022-2023 peak demand hour

**9th of March hour 8-9**  
Temperature -11 °C  (MWh/h)

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generation</td>
<td>11 240</td>
</tr>
<tr>
<td>Peak demand</td>
<td>12 190</td>
</tr>
<tr>
<td>Balance (net import)</td>
<td>- 950</td>
</tr>
<tr>
<td>Olkiluoto 3 Wind</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1760</td>
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</tbody>
</table>
Recovery
Finland's average electricity price slips into negative territory

The oversupply of virtually emissions-free electricity is mainly due to spring flooding, which is super-charging hydropower production.

An image of wind turbines in Imajoki. Image: Esko Janss / AOP

YLE NEWS
24:31:54

The price of electricity fell into negative territory on Wednesday before noon, with the market forecast expected to stay there throughout the day before climbing in the evening.

This is a historic moment, according to Jukka Ruusunen, CEO of grid operator Fingrid.

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Next winter
Next winter looks much better for Finland and for Europe!

• The whole society much better prepared. No dependency on Russia.
• Olkiluoto 3 in operation. 1500 MW of new wind power.
• New LNG terminals secure gas availability. Gas storage filling on a good level. Demand and price of gas have decreased considerably.
• Fingrid continues the voluntary power system support model as a contingency for electricity shortages.

However,

• Finland dependent on electricity imports during low wind days. Functioning of the common market important!
• Security environment around the Baltic Sea still uncertain – we must be prepared for worse scenarios.
Future
Preparing for security of supply to the end of the decade

- “When the wind is not blowing”
- Olkiluoto 3 plays a major role in security of supply in the future (more than 10% of peak load). Longer disturbance during winter period will be challenging.
- Aurora Line improves the situation in 2025
- Forecasted demand increase at the end of the decade challenges security of supply – especially if the new demand is not flexible
- What if market does not deliver investments in flexible generation? Fingrid has studied various options together with AFRY – opening of the discussion.
Thank you!

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