PV GRID database
National forum

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Corporate Research
WP2 execution
PV-GRID

Reducing barriers hampering large-scale integration of PV electricity into the distribution GRID

Goal to help reduce the legal, administrative and regulatory barriers in the PV project development processes that are delaying or complicating the large scale integration of photovoltaic (PV) systems on electricity distribution infrastructures across Europe.
FACTS

• Carried out by 21 project partners, covering 17 EU Member States
• Coordinated by BSW-Solar
• Countries involved: Austria, Belgium, Bulgaria, Czech Republic, France, Germany, Greece, Italy, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, the Netherlands, UK
• Project is funded by the European Commission under the “Intelligent Energy Europe” Programme
• Duration: 30 months (May 2012 – Oct 2014)
SWeden active in WP2 and WP4, did not participate in PV LEGAL
WP2 RESEARCH ON NATIONAL ADMINISTRATIVE FRAMEWORKS

• National PV markets are analysed focusing on **three PV market segments:**
  - residential systems (1-10 kWP)
  - commercial systems (10-1.000 kWP)
  - industrial ground-mounted systems (over 1.000 kWP)

• PV project development processes:
  1. Site Selection
  2. Electricity Production Licence
  3. Administrative Process
  4. Grid Connection Permit
  5. Support Scheme(s)
  6. PV System Construction
  7. Grid Connection and Commissioning
  8. Financing
  9. Corporate Legal-Fiscal
  10. PV System Operation

  Not all processes are relevant in all countries and the sequential order may change from country to country

• Indicators: Costs, Time and Labour
  - Duration
  - Waiting time
  - Legal-administrative Cost Share
  - Barrier severity
  - Legal-administrative Labour Requirements
  - Non Legal-administrative Labour Requirements
WP2 Research

• Severity of barriers ranked
  - 1-3: Small barrier – barriers which are inconvenient but are relatively easy to overcome and do not prevent further development
  - 4-6: Medium barrier – barriers which forces considerable efforts and investments to overcome and may prevent further development
  - 7-8: Severe barrier – serious barriers that are difficult to overcome and often prevent further project development
  - 9-10: Very severe barrier – barrier that practically prevents further market development
WP2 Research in Sweden

• Interviews made in three different segments
  ▪ Residential – 3 kW
  ▪ Commercial – 50 kW
  ▪ Industrial ground-mounted systems – 2500 kW
    ○ Not applicable to Sweden at the time of the interviews

• Five installation companies interviewed

• One common interview template used in all countries
BARRIERS TO PV SYSTEM DEVELOPMENT AND OPERATION

• A large part of the research carried out in PV GRID relates to the assessment of barriers encountered in the development and operation of PV systems

• More than 200 barriers have been identified, which have been grouped in 4 main categories:

  1. Permitting Procedures
     o Presence of restrictions on the land
     o Environmental impact assessment requirements
     o Regional regulations

  2. Grid-related
     o Grid connection costs
     o Grid access
     o Long waiting times

  3. Support-related
     o Complex and long procedures
     o Market caps
     o Regulatory uncertainty

  4. Operation & Maintenance
     o Unforeseen costs or diminished revenues
     o Administrative requirements
WP2 Results

- Presented in database
  [www.pvgrid.eu/database.html](http://www.pvgrid.eu/database.html) released 16 January

- Project report – first release soon
2/05/2013 10

WP2 - OVERVIEW OF RESULTS

PV project development: Legal-administrative Cost Share (over total project development costs in %)

- The share of legal-administrative costs over total project development costs, excluding PV equipment, (in %) can provide an idea of the economic burden that project developers have to bear.
- This burden is normally reflected in national PV system prices.
WP2 - OVERVIEW OF RESULTS

PV project development: Legal-administrative Labour Requirements (in man-hours)

- The total labour required for accomplishing the permitting and grid connection procedures can instead serve as a measure of the complexity and lack of transparency hidden within these administrative procedures.
• The total duration of the development process for a PV project is another measure of the economic risk faced by investors.

• The more it takes to build and connect a PV system, the longer investors are financially exposed without earning revenues.

• Additionally, the waiting time spent by a developer can be a measure of the inefficiency shown by such parties in dealing with their tasks.
SWEDEN summary

PV project development: share of administrative costs, duration and waiting time

Main market barriers

<table>
<thead>
<tr>
<th>Barrier Type</th>
<th>Name</th>
<th>Process</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support-related</td>
<td>Incongruous trading conditions of electricity certification system</td>
<td>Support Scheme(s)</td>
<td>The electricity certification system is not adapted to residential PV systems. The requirement of hourly production measurements forces the producer to buy a service that is too expensive to make any profit from the certificates.</td>
</tr>
<tr>
<td>Support-related</td>
<td>Cap of investment subsidy budget</td>
<td>Support Scheme(s)</td>
<td>Total government budget of investment subsidy is in 2012 limited to approx. €7 million. The budget is too low to allow for funding to all applicants.</td>
</tr>
<tr>
<td>Support-related</td>
<td>Electricity certificate value</td>
<td>Support Scheme(s)</td>
<td>The value of electricity certificates is set by the market and is too low to promote the market development. The production cost of PV electricity will not be lower than the electricity spot market price.</td>
</tr>
</tbody>
</table>

Market status

- The market for residential systems only exists since July 2009 when a new investment subsidy was introduced.
- Commercial systems are also mainly driven by the investment subsidy. However, there is a subsidy cap of 140,000 € per property setting an upper limit of roughly 200 kWp to the PV system size.
- There is no market for industrial ground-mounted systems in Sweden, due to the inapplicability of the support system for large installations.
# List of barriers in Sweden

From database

You are here: Database > Barriers

## Countries

- Residential Systems
- Commercial Systems
- Industrial Ground-mounted Systems

## Processes

- Overall Project
- Site Selection
- Electricity Production
- Administrative Process
- Grid Connection Permit

## Barriers

<table>
<thead>
<tr>
<th>Segment</th>
<th>Country</th>
<th>Process</th>
<th>Barriers</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Systems</td>
<td>Sweden</td>
<td>Support Scheme(s)</td>
<td>Cap of investment subsidy budget</td>
<td>8</td>
</tr>
<tr>
<td>Residential Systems</td>
<td>Sweden</td>
<td>Support Scheme(s)</td>
<td>Law for electricity certificates</td>
<td>8</td>
</tr>
<tr>
<td>Residential Systems</td>
<td>Sweden</td>
<td>PV System Operation</td>
<td>Designation of investment subsidy budget</td>
<td>5</td>
</tr>
<tr>
<td>Residential Systems</td>
<td>Sweden</td>
<td>PV System Operation</td>
<td>Electricity certificate measurements</td>
<td>5</td>
</tr>
<tr>
<td>Residential Systems</td>
<td>Sweden</td>
<td>PV System Operation</td>
<td>Electricity certificate value</td>
<td>5</td>
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<tr>
<td>Residential Systems</td>
<td>Sweden</td>
<td>Support Scheme(s)</td>
<td>Trading of electricity certificates</td>
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<tr>
<td>Residential Systems</td>
<td>Sweden</td>
<td>Support Scheme(s)</td>
<td>Administration of electricity certificates</td>
<td>4</td>
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<td>Residential Systems</td>
<td>Sweden</td>
<td>Administrative Process</td>
<td>Building permit rules</td>
<td>3</td>
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<tr>
<td>Residential Systems</td>
<td>Sweden</td>
<td>Administrative Process</td>
<td>Appeal against building permit</td>
<td>3</td>
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<td>Residential Systems</td>
<td>Sweden</td>
<td>Grid Connection Permit</td>
<td>Pre- and ready-notification demand</td>
<td>3</td>
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<td>Residential Systems</td>
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<td>PV System Construction</td>
<td>Laws and regulations</td>
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<td>Residential Systems</td>
<td>Sweden</td>
<td>Grid Connection &amp; Comm.</td>
<td>Awareness of law Ellag</td>
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</tr>
<tr>
<td>Residential Systems</td>
<td>Sweden</td>
<td>Grid Connection &amp; Comm.</td>
<td>Exchange of electricity meter</td>
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<tr>
<td>Residential Systems</td>
<td>Sweden</td>
<td>PV System Operation</td>
<td>Hourly production measurement</td>
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<td>Sweden</td>
<td>Support Scheme(s)</td>
<td>Distribution of investment subsidy budget</td>
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<td>Residential Systems</td>
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<td>CE-marking</td>
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<td>Sweden</td>
<td>PV System Construction</td>
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<td>Grid Connection &amp; Comm.</td>
<td>Grid capacity cap</td>
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<tr>
<td>Residential Systems</td>
<td>Sweden</td>
<td>PV System Operation</td>
<td>Yearly production report</td>
<td>1</td>
</tr>
</tbody>
</table>

## Map

Countries highlighted in blue.

**Country Map**

- Residential Systems
- Commercial Systems
- Industrial Ground-mounted Systems

**Map Legend**

- Residential Systems
- Commercial Systems
- Industrial Ground-mounted Systems

**Map Features**

- Overall Project
- Site Selection
- Electricity Production
- Administrative Process
- Grid Connection Permit

**Map Information**

- Compare Results

**Website**

www.pvgrid.eu

**Date**

2/05/2013
Average process duration – Residential systems

Sweden at the bottom...

National PV Framework Assessment by average Process Duration

Legend
- smart
- fair
- improvable
- troublesome
- bad
- no value

Click on a country for detailed info
Sweden – Process duration

Long waiting time (for investment subsidy)

National Contact Point: Solar Energy Association of Sweden - Bengt Stridh (bengt.stridh@abb.com)

Sweden: Residential

Until 2006 all off-grid PV systems had the largest share of installed PV capacity in Sweden. An investment subsidy was available from mid 2005 to the end of 2008 for grid connected systems on official buildings. In July 2009 a new investment subsidy started ... (Unhide text)

The most common application today is probably roof-mounted grid-connected residential PV systems, with the reservation that no official statistics exist on the different market segments. There is also an off-grid market that until 2008 was larger than the total on-grid market in Sweden.

Segment

Residential Systems
Commercial Systems
Industrial Ground-mounted Systems

Compare Results

Barriers List

Legend
smart
good
improvable
troublesome
bad
Severe barrier

Database Help
Segments
Processes
Steps

Duration Labour Share of costs

Most of the duration is waiting time for investment subsidy decision. In general this waiting time is estimated to 1-2 years in average, but it is hard to project currently since the new regulation starting in 2013 is not released.

The waiting time is mainly for the investment subsidy, and this time varies between the 21 county administrations. An application at the end of 2012 will most likely not be granted in 2013 and maybe not even in 2014. One uncertainty is if and how the new regulation starting in 2013 will be changed compared to the current regulation for investment subsidy.
Sweden – Electricity certificate system

- Hourly production measurements required during 15 years
- The measurements and report to Swedish National grid has to be done by a body that has this authorization, that not necessarily is the grid operator
- The measuring point for the electricity certificates can be at another location than the measurement of the electricity fed into the grid
- At 2012 year end 123 PV systems had applied for electricity certificates ~1/10 of the PV systems in Sweden
- The electricity certification system is not adapted to residential PV systems
- The demand of hourly production measurements demands the producer to buy a service that is too expensive to make any profit from the certificates
- The producer can get certificates without cost for excess electricity fed into the grid, but this give certificates only for a limited part of the full production
- In addition, the value of certificates is too low to promote the market development
WP2 More information

- More detailed information can be found online in the PV GRID database at http://www.pvgrid.eu/database/

- Update will be made during 2013

- If you have any input do not hesitate to get in contact with
- Bengt Stridh, bengt.stridh@se.abb.com, 021-32 30 67
Thank you for your attention

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• Vilka administrativa och legala frågor har du mött?
  ▪ Detaljplan
  ▪ Offertförfrågan
  ▪ Bygglov
  ▪ Krav från nätägare
    ○ Skillnader mellan nätbolag
  ▪ Föranmälan
  ▪ Konstruktion
    ○ Elinstallationsregler, Elsäkerhetsverket, CE-märkning, ...
  ▪ Nätanslutning vid färdiganmälan
    ○ Byte av elmätare
    ○ Var överklagar man om nätägaren ej godkänner anslutning?
  ▪ Investeringsstöd
  ▪ Elcertifikat
  ▪ Drift
  ▪ Energiskatt
  ▪ Inkomstskatt
  ▪ Finns olikheter mellan 3 kW, 50 kW och 2500 kW