DOCKET
11-IEP-1G
DATE May 09 2011
RECD. May 13 2011

European Experience with Renewables on Public Property

IEPR Committee Workshop
May 9, 2011

Christian Hewicker, KEMA - Bonn, Germany

David Korinek, KEMA - San Diego, CA

Karin Corfee, KEMA - Oakland, CA

Experience you can trust.

Key Questions Investigated (Memo 3)

- Do European countries place solar DG on government buildings? Is this a common practice or a new practice?
- Do renewable DG projects on government properties go through the normal or an expedited permitting process?
- How do European programs for renewable DG address:
  - Construction safety issues along highways;
  - Condensation issues on or around waterways;
  - Security and maintenance of equipment & surrounding areas;
  - Public experience of equipment being highly visible?
- How are corresponding projects financed? Are there special or higher incentives or tax credits? What are the ownership and revenue structures?

Promotion of renewable energies represents a cornerstone of the EU‘s climate policy

- Promotion of renewable energies represents one of the three pillars of the EU’s “20:20:20” goals for the year 2020, i.e.
  - 20% reduction of greenhouse gases
  - 20% reduction of energy consumption (energy efficiency)
  - 20% share of renewable energies in primary energy demand
- The last two items are associated with binding national targets for each Member State
- Through Directive (2009/28/EC), the EU has created a set of minimum conditions for the treatment of renewable energies (e.g. priority / guaranteed access to the network) and obliged Member States to put in place suitable mechanisms for providing necessary (financial) support schemes

Promotion of renewable DG in Europe generally based on standardized feed-in tariffs (FiT)

	Austria	Germany	Spain	Switzerland
Promotion model applied	FiT	FiT	Hybrid: FiT + Market Premium	FiT
Purchase obligation by system operator, market operator or network operator?	✓	✓(1)	✓	✓
Tariff (rate) digression (e.g., annually) for new installations?	✓	✓	✓	✓
Are total promotional funds and/or annual capacity increment capped?	✓	No(2)	✓	✓
Is solar power promotion split according to installation type?	✓	✓	✓	✓
Can grid operators curtail renewable DG resources?	No Info	✓(3)	✓(4)	No Info

(1) - Opt-out for direct sales in bilateral market
(2) - Future FiT's will be reduced if annual capacity addition exceeds a certain target
(3) - TSOs / DSOs can curtail any unit ≥100 kW (except for PV)
(4) – TSO can curtail any unit ≥10 MW

Renewable DG represents only one of the target areas identified by European legislation

- Besides electricity production, Directive (2009/28/EC) also covers other sectors, such as transport, heating and cooling
- Directive 2009/28/EC explicitly calls on Member States to ensure that new / renovated public buildings fulfill an exemplary role, for instance by facilitating the use of roof-based installations for the production of energy from renewable energy sources
- However, Directive 2009/28/EC equally mentions compliance with zero energy housing standards (energy efficiency) as an alternative approach for the public sector

Historically, the role of public authorities generally limited to “facilitating” the growth of renewable DG

- Public policy in European countries largely based on providing the basis for private investments into renewable DG
- Although various ministries, state offices and municipalities have invested in solar PV on public buildings, these are generally limited to pilot / promotional installations
- Potential reasons for the limited scale of large-scale programs for the structured use of public property for renewable DG:
  - Lack of harmonization between federal, state and local governments
  - Public budget constraints and competition with other political goals (such as improved energy efficiency)
  - Overwhelming success of feed-in tariffs
  - Complexity and costs of public procurement

Specific programs and incentives in Spain and Germany

- In **Spain**, various provinces and municipalities have created local programs for the promotion of renewable energies, often including solar thermal heating as well as solar PV
- In **Germany**, renewable DG in the public area is mainly promoted through:
  - Granting investors access to roofs of public buildings (under the standard FiT schemes)
  - Allowing renewable DG on public land
  - Investments by publicly owned utilities (acting as other investor-owned utilities)
  - Granting of feed-in tariffs for solar PV installations along interstate highways and railroads

Solar Support for Schools Program in Germany

- In **Germany**, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety has initiated the **Solar Support for Schools Program**. The initiative provides
  - Funding for building solar panels at schools and installing visualization tools to assist student's education regarding renewables
    - Target 400 schools
  - Up to €400 million will be made available in 2011 from the sale of CO2 emission allowances

Germany's support of PV installations along interstate highways and railroads

- The latest revision of the Renewable Energies Act (EEG) in 2009
  - Specifically identified feed-in tariffs to solar PV on Installations within 110 m of interstate highways and railroads
  - Excluded PV installations on arable land and other open spaces
- Support of PV installations along highways and railroads not limited to public land and includes noise abatement structures
- Theoretical potential
  - 12,500 km (7,800 miles) of interstate highways
  - 34,000 km (21,000 miles) of railroads
- No differentiation between public / private installations or public / private land and buildings

The 2009 legislation has already resulted in an increased use of interstate highways for solar PV

- First installation from 2004 has recently been expanded
- Several other projects have been realized since 2009

1.6 MW Project for Enclosure of Noise Protection Walls

Highway A3 between Goldbach and Hösbach

Solar PV Installation at an Earthen Slope used for Noise Abatement on Highway A96

Use of highway and railroad corridors limited by several factors

- Several reasons suggests that only a part of the theoretical potential mentioned above will actually be realized:
  - Mix of public and private property
  - Agricultural use, forests and residential developments within possible corridors (especially for railroads)
  - Legal and administrative restrictions on installations within 40 m of interstate highways
  - Limited lifetime of solar panels installed along highways
  - Public budgetary restrictions
  - Unclear separation of ownership and operating duties for public-private noise protection structures

Use of highway and railroad corridors – other factors

- Federal law on highways (Law on Motor Ways) guides transportation safety assessment
  - The law prohibits installation of structures within 40 meters of the highway
  - Within a distance of 60 – 100 meters from the lane's edge, a construction permit from the federal-state's highway operation office is required in addition to normal construction permits
  - Ground-based PV installations are only eligible for remuneration if they are commissioned within the framework of a local development plan and a planning procedure pursuant to the building code
  - This implies the highway office's prior consent for construction, and possibly an annulment of the ban on construction within 40 meters of the lanes

Summary of Observations

- **Do European countries place solar DG on government buildings? Is this a common practice or a new practice?**
  - Although European countries do place solar DG on public buildings and land, this is not yet a wide-spread practice
  - In general, publicly owned projects on public property is inhibited by budgetary restrictions, public procurement rules, etc.
  - Public roofs and land are most commonly used by private investors (against a lease), subject to general development and environmental restrictions
  - Some limited expansion of DG on state property in Europe may occur due to
    - Compliance with top down Directives, i.e. Directive 2009/28/EC may result in increased use of public property from 2012 onwards, municipal authorities required to check their internal processes for sustainability and energy efficiency to serve as an example to the private sector, etc.
    - Economic drivers (income from land sales, leasing fees, taxes)
    - Public pressure / support

Summary of Observations

- **Do renewable DG projects on government properties go through the normal or an expedited permitting process?**
  - In all countries examined, installations on public property are subject to the same rules for interconnection and financial support as any other renewable DG installation
  - Local development plans often have to be adjusted to allow renewable development on public lands / buildings
  - There are often longer lead times for solar projects built on municipal property than on private land
    - More lengthy and complex approval process, particularly if public safety, health, environmental impact, insurance, or other issues are of concern to public authorities

Summary of Observations

- **How do European programs for renewable DG address issues such as construction safety issues along highways, condensation issues on or around waterways, security and maintenance of equipment & surrounding areas and public experience of equipment being highly visible?**
  - While there are not special provisions in Austria, Spain or Switzerland, Germany has explicitly extended feed-in tariffs for solar PV installations along interstate highways and railroads
  - In Germany, recent rules for installations along transport corridors have led to an increase of projects being contemplated / realized
    - Federal law on highways (Law on Motor Ways) guides transportation safety
    - Approval responsibilities are dispersed among federal, federal-state and municipal administrations leading to complexity of approval process
    - There is minimal development of DG projects along waterways or railways
      - Use of such corridors may be limited by environmental constraints, safety concerns and opposition from the public

Summary of Observations

- **How are corresponding projects financed?**
  - Private /company investors and local authorities(municipalities) usually do not have access to the same funds
  - Access to investment credits and foreign capital is limited to private enterprises, while municipalities are excluded
    - Investment credits are often provided from funds granted by federal, state or municipal authorities and lending institutions
  - For fully dedicated municipal projects, financing typically comes from municipal budgets, local banks and different funding sources that subsidize regional development, energy efficiency in public property, etc.
  - Public-private partnerships
    - Public-private partnerships typically have access to investment credits and foreign capital
    - Local banks also fund public-private partnerships

Summary of Observations

- **Are there special or higher incentives or tax credits?**
  - Installations on public property are subject to same rules and financial support with respect to the primary legal renewables promotion scheme
- **What are the ownership and revenue structures?**
  - Investor led projects, includes projects owned by local utilities
  - Public-private partnerships
  - Cooperative projects
  - Energy contracting
  - Public ownership
  - Operational responsibility and ownership by municipal administration

Question and Answer Session

Thank you for your attention.

Email Contact info:
Christian.Hewicker@kema.com
David.Korinek@kema.com
Karin.Corfee@kema.com

Experience you can trust.