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"CONNECTING POLICY, TECHNOLOGY & FINANCE THROUGH KNOWLEDGE"

Workshop Report

Urban Energy Revolution Workshop & Solar Policy Development for Policy Makers

Astana, Kazakhstan

24 – 28 July 2017

Prepared by the Sustainable Energy Association of Singapore (SEAS)

Contents

CBP-04. Urban Energy Revolution & Solar Policy Development for Policy Makers 24 – 28 July 2017

For most of history, the majority of humans lived a rural life and used only renewable energy to meet their needs. Two and a half centuries ago, mankind began to exploit fossil fuels, starting with coal, then adding oil and natural gas. Fossil fuels powered the industrial and agricultural revolutions, triggering a migration to cities along with unprecedented growth in human population and GDP.

As the 21st Century dawned, we began to sense the limits of this growth spurt, and approached consensus on the need to live more sustainably, or face uncertain consequences of climate change, fresh water shortage and economic stagnation. But how to promote sustainability without reducing quality of life? And what about the developing world, which aspires to the living standards enjoyed by people in cities such as Singapore?

The first day of this workshop focuses on the energy aspects of the sustainability challenge. It looks at the key technologies in energy efficiency, renewable energy and storage and water management. Given that over 50% of global population is now urban, the seminar also examines policies to change human behaviour in smart cities, using Singapore as an example.

From the second day onwards the participants took part and comprehensively discuss the technical, policy and commercial aspects of integrating solar energy in the grid. Case studies discussed illustrates the impact of solar energy, which is subject to sunshine variability and intermittency. The workshop includes a site visit to a large rooftop solar plant.

Utility electric grids are facing major transformation from traditional networks supplied by large-scale centralised conventional power plants. They must now accommodate growing levels of widely distributed, small scale and non-dispatchable renewable energy generators. It is vital for stakeholders to understand the benefits and challenges of increasing grid-interactive solar penetration levels.

Participants learnt the basic technical and commercial operating mechanisms of electricity grids, and appreciate how grid-interactive solar energy changes these dynamics. They explored ways to increase solar energy's share of electricity demand, without destabilising the grid. This knowledge will help them assess vested interests and concerns of relevant parties, whether they work for renewable energy developers, investors, the utility, regulators or policy makers.

24 participants (listed in Annex 1) from 7 countries attended the 5-day workshop. . There were 5 resource speakers from Singapore, 1 from Germany presenting and sharing their knowledge and expertise with the participants in the workshop.

Programme Day 1 – Mon, 24 Jul 2017

This first day was a high-level, one day session intended for the upper level policy makers to gain an overview of the issues our planet is facing due to climate change and energy poverty. This was supplemented by sharing of Singapore experience and schemes such a GreenMark and policy examples like the Energy Conservation Act.

The economic case for solar PV as a solution, along with discussions on the use of energy in smart cities were also covered. The one day session concluded with a session on how policies and incentives need to evolve to encourage the deployment on such technologies.

Programme Day 2 – Tue, 25 Jul 2017

Day 1 of the policy development workshop was dedicated to set the scene of how PV as a technology works. Discussions included discussions on how PV systems were designed, basic calculations on PV energy yield and simple paybacks.

Innovative business models in PV and the use of PV in micro-grids was also touched on to give the participants ideas around how PV can be applied in real world applications

Programme Day 3 – Wed, 26 Jul 2017


The second day of the programme was focused on how PV as a technology could be integrated with our electricity grid. The participants were given an overview of how the Grid works and were shown how PV and other renewables affect reliability of the grid.

Methods to overcome intermittencies, such as demand response and Time of Use metering were also covered, showing the participants how Singapore treats Renewables and the challenges we face.


There was also a session on PV Module manufacturing and the value chain for PV. Special attention was paid to the economic and political conditions that are required to allow for Manufacturing Facilities to be set up in a country.

Programme Day 4 – Thu, 27 Jul 2017

The first half of the day comprised of a site visit to Nazarbayev University. Participants were given a tour of the Solar PV related test-beds which included the following:

- 3 PV systems
  - Fixed
  - Dual tracking PV System (one of the actuators is broken so it only tracks one way)
  - Parabolic Mirrors + Single Tracking
- Passive House
- Solar Thermal system

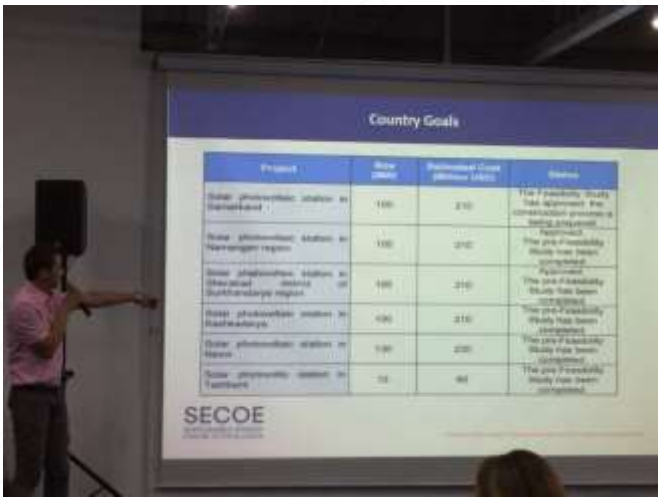
The second half of the day was reserved for a talk on the costing of Solar systems and how these systems could be financed. Some time was also allocated for the participants to start putting their thoughts and leanings together in preparation for their country presentations on Day 5.

Programme Day 5 – Fri, 28 Jul 2017

The last day of the programme touched on the specifics of solar system design and how to ensure quality is maintained during the deployment of the systems.

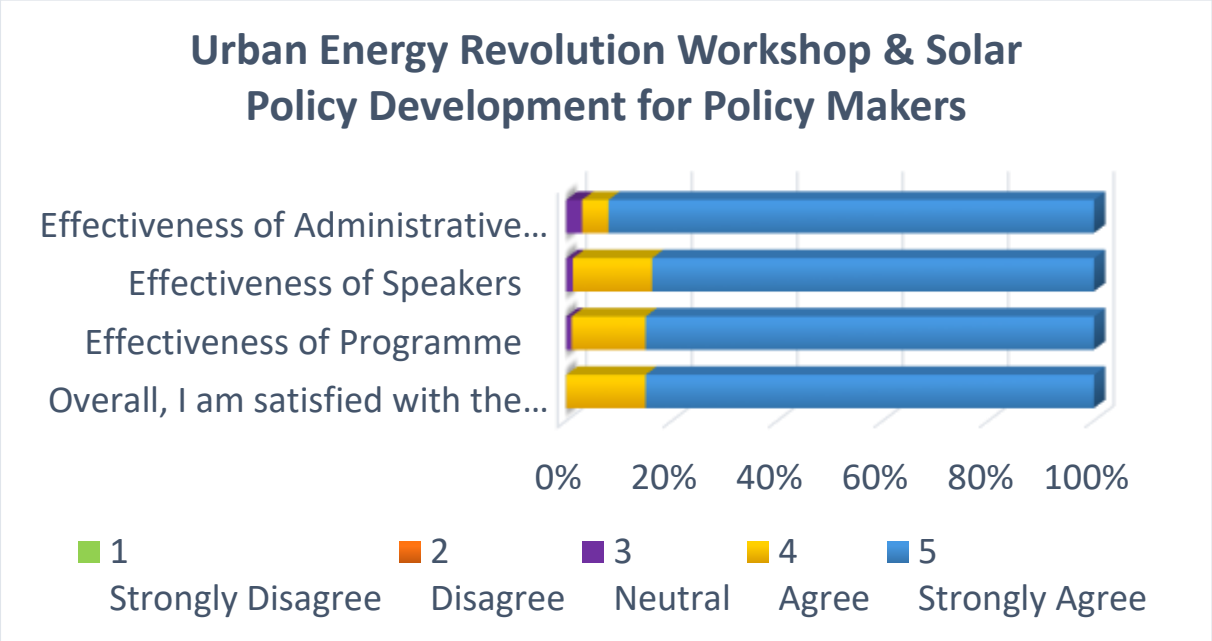
The session concluded with each country giving a 10-minute presentation which covered the following:

- Country Goals for PV deployment
- Current Situation & Desired Targets
- Barriers faced and Strategies to overcome them
- Budget and Resource Requirements



Feedback

At the end of the workshop, the participants' responses were extremely positive in all aspects of the programme and logistics.



Annex 1 – Participant and Speaker List

No.	Title	Full Name	Job Title	Name of Institution/ Organisation	Country
1	Mr	Abrahamyan Hovhannes	Chief Specialist	Ministry of Energy Infrastructures and Natural Resources of the Republic of Armenia	Armenia
2	Mr	Armen Qocharyan	Senior Specialist of Construction Policy and Pricing Methodology Division	Construction Science and Technology Norm Department	Armenia
3	Ms	Mammadzada Parvin	Investment Adviser	State Agency on Alternative and Renewable Energy Sources of the Republic of Azerbaijan	Azerbaijan
4	Ms	Osmanov Khalid		Ministry of Energy	Azerbaijan
5	Mr	Sadigov Elman	Director of Risk Management Department at AtaBank OJSC	Ministry of Energy	Azerbaijan
6	Mr	Suleymanov Anar	Head of Department	The State Agency on Alternative and Renewable Energy Sources of Republic of Azerbaijan	Azerbaijan
7	Ms	Beridze Natia	Chief Specialist	Ministry of Energy of Georgia	Georgia
8	Mrs	Jamburia Natalia	Chief Specialist	Ministry of energy of Georgia	Georgia
9	Ms	Mariam Khosroshvili	Senior Specialist	Ministry of Energy of Georgia	Georgia
10	Mrs	Pirtskhelani Nana	Adviser	Ministry of Energy of Georgia	Georgia

No.	Title	Full Name	Job Title	Name of Institution/ Organisation	Country
11	Mr	Abdullakh Abishev	Chief Expert	Committee for Roads Ministry of Investment and Development of Kazakhstan	Kazakhstan
12	Mrs	Baramyssova Saule	Manager of Division	JSC KEGOC	Kazakhstan
13	Ms	Beissekeyeva Zarina	Chief Expert	Technical Regulation and Metrology Committee	Kazakhstan
14	Mr	Feklistov Dmitriy	Head of Division	JSC KEGOC	Kazakhstan
15	Mr	Ruslan Dosmaiyl	Leading Specialist	Financial Settlements Center of Renewable Energy LLP	Kazakhstan
16	Ms	Abakirova Aigerim	Head of Department	National Energy Holding Company OJSC	Kyrgyzstan
17	Mr	Khalmurzaev Asylbek	Head of Department	National Energy Holding Company OJSC	Kyrgyzstan
18	Ms	Gulafruz Razokova	Scientific Secretary	Ministry of Energy and Water Resources of the Republic of Tajikistan	Tajikistan
19	Mr	Ahadzoda Bahodur	Head of Department	Ministry of Economic Development and Trade Tajikistan	Tajikistan
20	Mr	Bakhodir Boliev	Junior Researcher	International Solar Energy Institute	Uzbekistan
21	Mr	Matkurbonov Farrukh	Specialist	JSK "Uzbekenergo"	Uzbekistan

Registered but did not attend

No.	Title	Full Name	Job Title	Name of Institution/ Organisation	Country
1	Ms	Aizhan Kassymbekova	Leading Specialist	JSC Financial Settlement Center	Kazakhstan
2	Mrs	Bakatova Zhanar	Senior Expert	The Ministry of Energy of Kazakhstan	Kazakhstan
3	Ms	Raigul Bulekbayeva	Chief Expert	Chief Expert, Department of Renewable Energy Sources	

No.	Title	Full Name	Job Title/ Position	Name of Institution/ Organisation	Country
1	Mr	Mark Netto	Co-Founder	75 Ventures Pte Ltd	Singapore
2	Mr	Edwin Khew	Chairman	Decision Point Global (Asia) Pte Ltd	Singapore
3	Mr	Christophe Inglin	Managing Director	Energetix Pte Ltd	Singapore
4	Mr	Cemil Seber	Vice President	REC Solar	Germany
5	Dr	Thomas Reindl	Deputy CEO	Solar Energy Research Institute of Singapore (SERIS)	Singapore
6	Mr	Vijay Sirse	Founder Chairman and CEO	vTrium Energy Pte Ltd and Red Dot Power	Singapore