

Plans for A China-East Asia Efficient Renewable Supergrid

I. Location of Networked Large Scale system Renewable Generation by type and output to meet projected demands.

A. Use of advanced methods for optimizing renewable generation by type and determining output through comprehensive weather data analysis.

B. System simulation modeling that includes integration and optimization of system generation combined with:

i Distributed renewable generation (DG),

ii Distributed storage (DS) and system based storage such as compressed air and large dispatchable hydro, cogeneration,

iii District heating and cooling and thermal storage,

iii Electric vehicles and hybrid vehicles with their batteries as part of grid balancing and storage regime in Vehicle to Grid (V2G) and Vehicle to home (V2H) modes

iv. Efficiency load shedding, shifting and storage.

C. Transmission and Control Resources for SuperGrid

i. Optimizing HVDC transmission systems in above ground and underground modes such as El-pipes to facilitate high population center loops with multiple substation entry and exit points

ii. Control systems that facilitate system durability and security that include use of end use ability sense changes in voltage and frequency that will automatically scale up, down or disconnect to maintain system state avoid blackouts and operate using local renewables if necessary in reduced power mode, and be highly resistant to cyber attack and malware.

II. Economic Measures to Assist Market Based Implementation

This will include the work product of other working groups including measures such as Advanced Energy Performance Contracting, Renewable and Efficiency Energy Hedges, Infrastructure Bank, Per Capital Energy and Carbon Entitlements and Sustainability Assessments to Value Ecology (SAVE).

Estimate regional and global markets for efficient supergrid related technologies.

III. Efficient Renewable Supergrid in Context of One Trillion Ton Global Carbon CAP

One trillion ton cumulative global carbon Cap is essential to keep global climate increase below 2 degrees C. (Myles R. Allen, 2009. "Warming Caused by Cumulative Emissions towards the Trillionth Tonne. *Nature*, Vol.458 pages 1163-1166. April 30, 2009.)

A. Determine carbon reduction of Supergrid and contribution toward meeting global target.

B. Determine fractional coefficient of partial completion of China-East Asia renewable supergrid to meeting global target.

C. Estimate carbon reduction of other continental supergrids toward meeting global carbon reduction target.