Liu Qianjin, Chief Technology Officer, ABB China Limited, Dec 18, 2013

Asian Energy Highway Enabling the next generation grid



About myself

- PhD & MSc at Tsinghua University (1996-2002)
 - 20Mvar StatCom Development
- R&D with ABB since 2003
 - High Voltage DC Transmission
 - Grid Economical Simulation
 - Renewable integration
- Chief Technology Officer since 2010



High Voltage DC Transmission (HVDC) Motivations and Benefits of HVDC





HVDC limitation today - point to point power highways More power and lower losses

Capacity up 6 times since 2000; Voltage up from +/- 100kV to +/-800kV since 1970

Xiangjiaba -Shanghai ± 800 kV UHVDC. World's most powerful link commissioned



HVDC Classic

Transmission

Capacity up 10 times; losses down from 3% to 1% per converter station since 2000

BorWin:

400 MW, 200km subsea and underground World's most remote offshore wind park





World's longest / highest power capacity - first 800 kV commercial link -



Integrating the world's most remote offshore wind farm



© ABB

HVDC Grids – Why? Regional to continental HVDC Grids



Mechanical Breaker Dever electronic Dever electronic Main power electronic breaker

D. Main electronic breaker block in the lower path



Why DC Grids vs point to point DC links or AC?

- Only relevant offshore solution
- More efficient on long distances
- Fewer converters lower cost
- Redundancy

Why now:

- Offshore wind, remote solar, grid constraints
- HVDC Light systems and components mature
- Right of Way

Challenges:

- DC Breakers & DC/DC Converters
- Regulatory framework



Asian Energy Highway GMR & Southest Asia DC grid

Greater Mekong Region (GMR)& Southeast Asia DC grid – VSC based

- The less exchanged power;
- The weaker receiving ac network;
- The flexible power trade;



GMR & Southeast Asia DC grid by ABB



Power demand and supply of the region in 2025

Source: Electricity Generating Authority of Thailand (EGAT)





Asian Energy Highway Mongolia-East Asia DC grid

Mongolia-East Asia DC grid – LCC based

- The more exchanged power;
- The strong receiving ac network;
- The flexible power trade;

Mongolia-East Asia DC grid by ABB





预览已结束,完整报告链接和二维码如下:

https://www.yunbaogao.cn/report/index/report?reportId=5_5866

