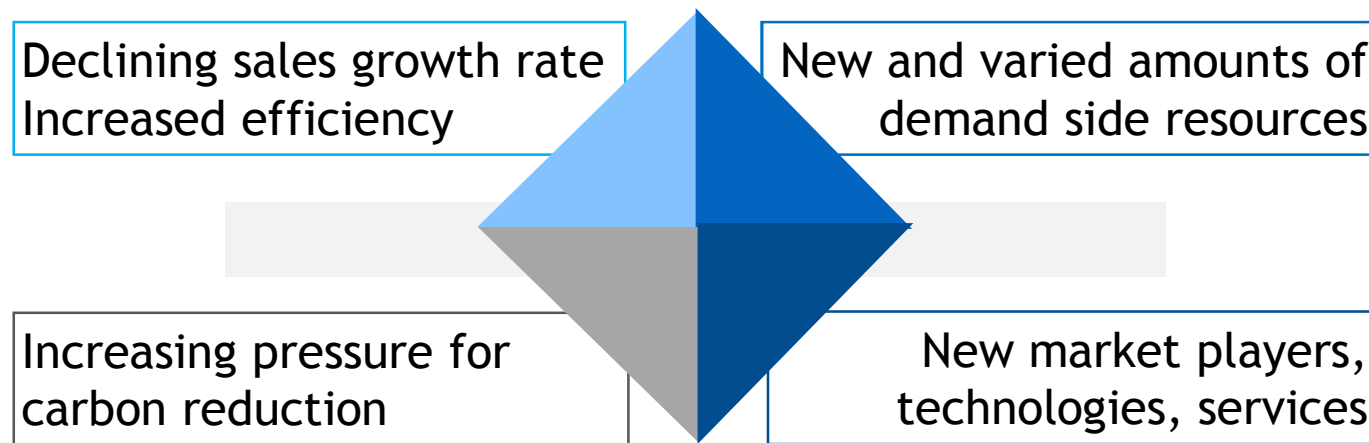

UPGRADING TO NEXT GENERATION DSM PROGRAMS



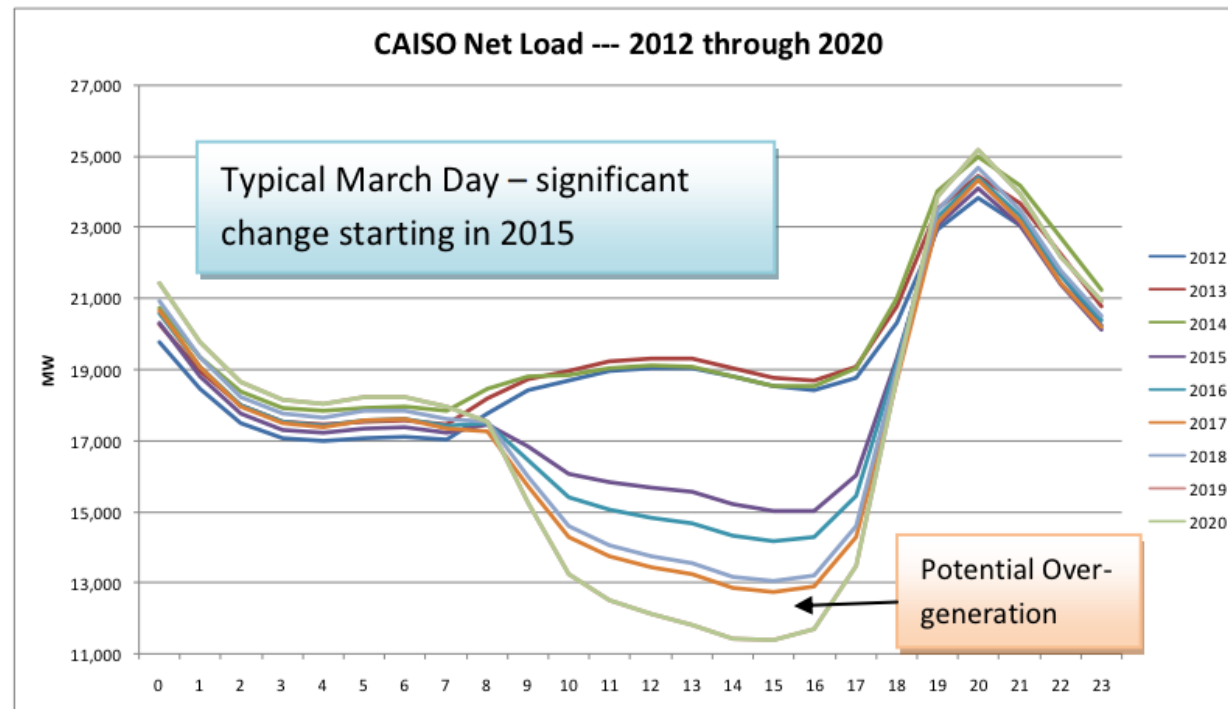
*MONA YEW
FEBRUARY 26, 2016
SYDNEY, AUSTRALIA*

Power sector landscape is changing

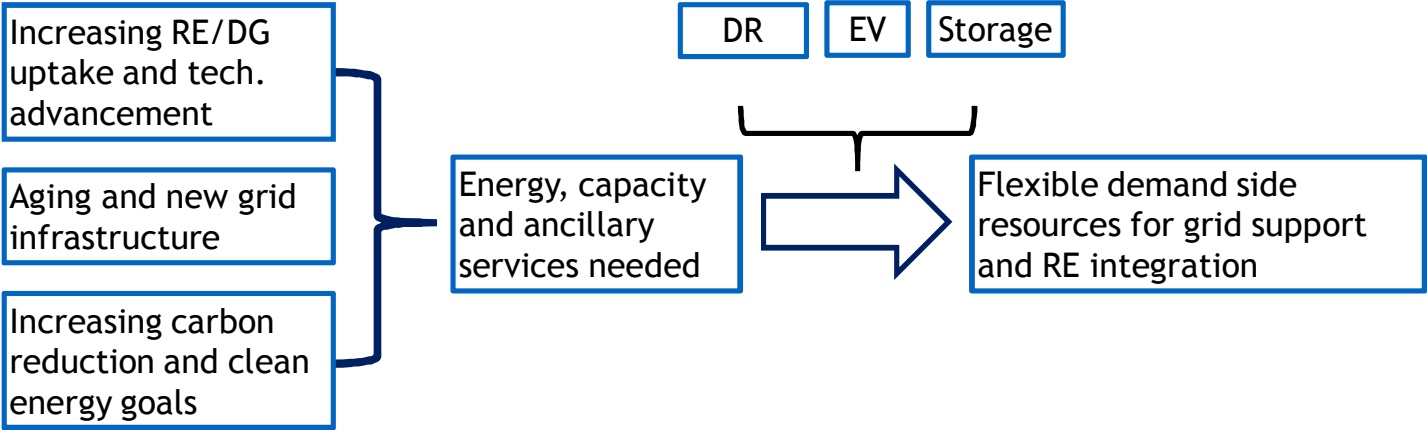


Delivering electricity service is no longer business as usual

California's "Duck Curve":



The next generation of DSM is about flexibility



New partnerships, pilots, and initiatives are underway

Dispatchable Demand Reduction



- Independent power producer purchasing demand response company (e.g. NRG)
- Utilities partnering with big data service providers (e.g. GridX, Opower)

Renewable Energy Integration



- Transmission system operator working with companies (e.g. Denmark EDISON)
- Government working with multi-industry stakeholders (e.g. Jeju Island)

Grid System Support



- Utilities partnering with auto companies on smart charging of electric vehicles (e.g. BMW)
- Vehicle to grid pilots to provide frequency regulation services (e.g. PJM)

Opportunities in China

China is in a major energy transition

China's Power Grid Today:

- Coal-fired power dominates
- Growing “peak-valley” differential in urban center
- Significant curtailment of renewable energy

2015:

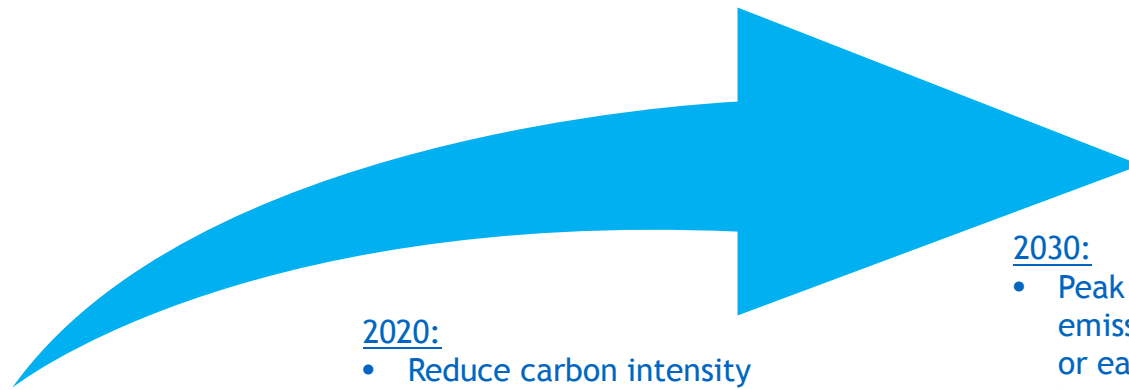
- 13th FYP goal to reduce energy intensity by 16%
- Pledged to prioritize clean electricity through green dispatch

2020:

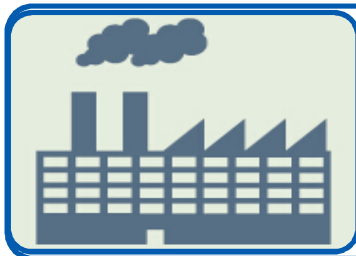
- Reduce carbon intensity by 40-45% from 2005 levels
- Reach goal of 5 million new energy vehicles on the road

2030:

- Peak CO₂ emissions by 2030 or earlier
- Increase share of non-fossil fuel in primary energy mix to ~20%
- Reduce carbon intensity by 60-65% from 2005 levels

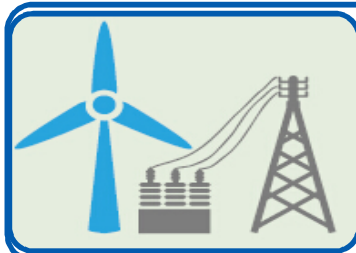


NextGen DSM can help bridge the present to the future



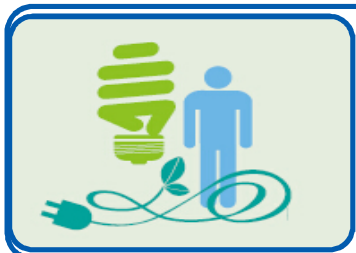
Serving as a **dispatchable** resource for providing grid support

- > Improve grid stability and reliability
- > Increase power system efficiency
- > Reduce need for new coal-fired generation and associated emissions



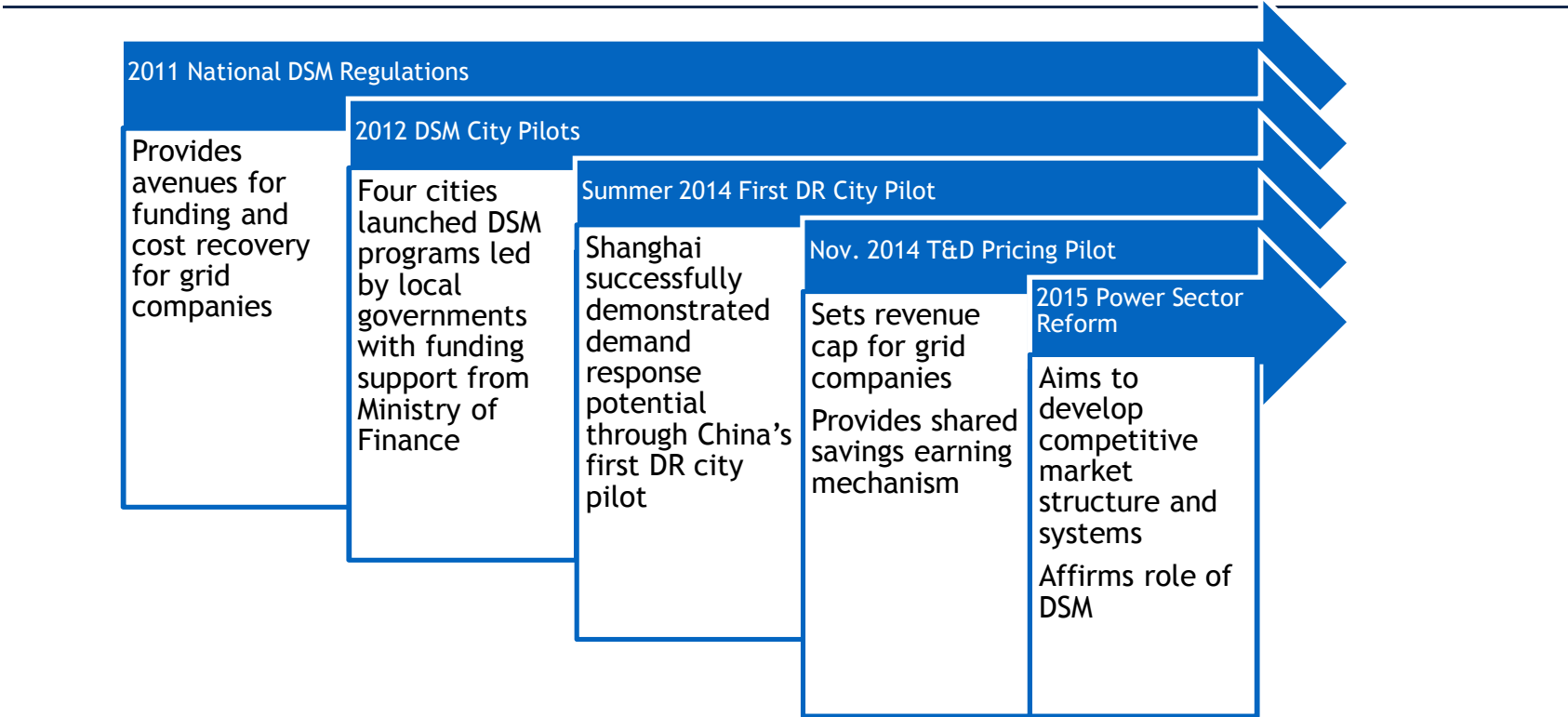
Serving as a **flexible** resource for integrating intermittent renewables

- > Improve power grid balancing capability
- > Increase renewable energy uptake
- > Reduce reliance on fossil fuel generation



Promoting electricity **market development**

- > Encourage consumer behavior change
- > Create new business opportunities for consumers, utilities and third parties

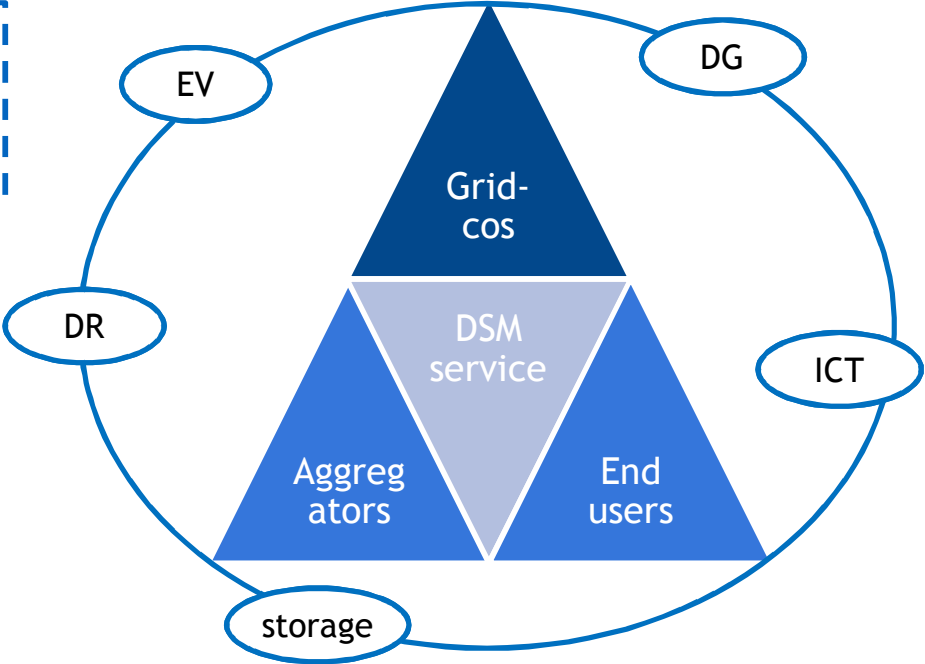


Power sector reform provides additional opportunities

- China's current reform is comprehensive:
 - Renewable energy integration
 - Demand side management
 - Transmission and distribution pricing
 - Power market structure and construction
 - Power generation and consumption planning
 - Retail competition
 - Electricity trading system and regulation
 - Coal-fired self generation
 - ...

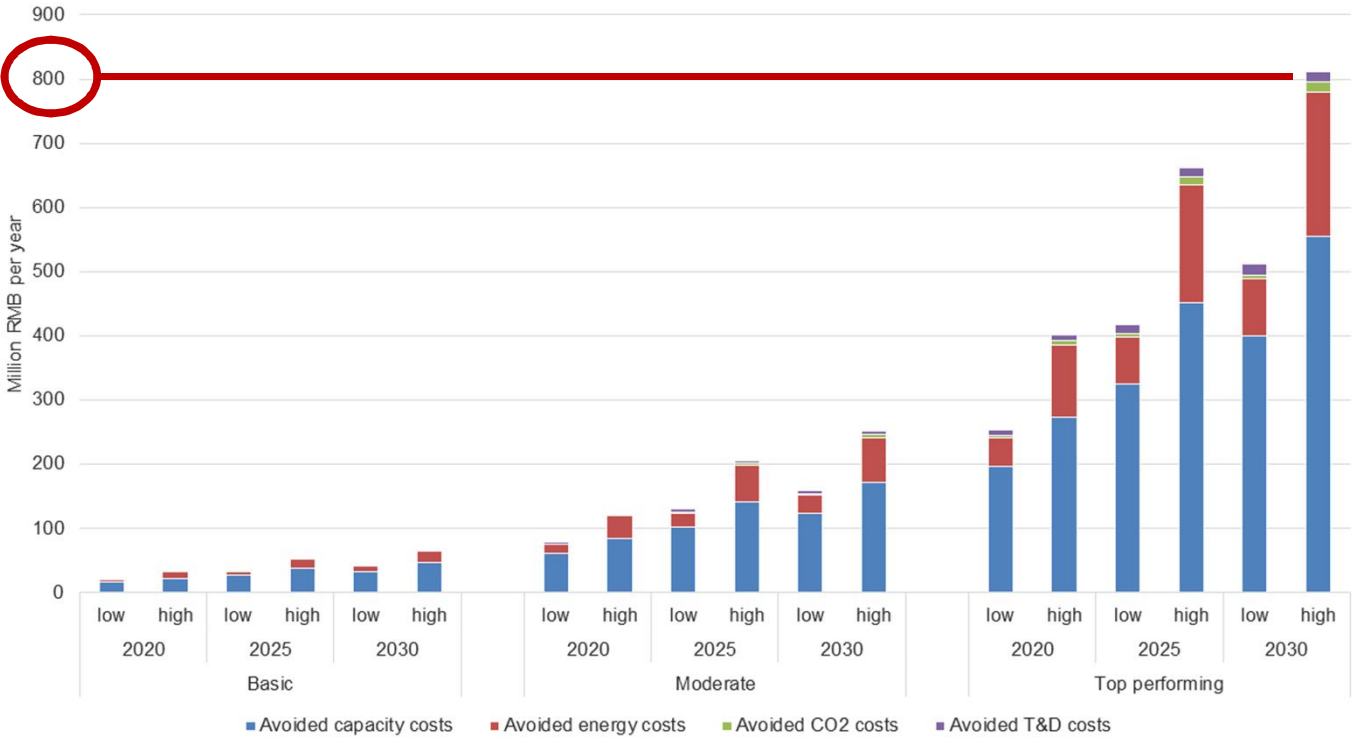
Market for demand side resources is emerging

But sustainable business models and mechanisms to monetize economic benefits are still needed



Market value of demand response can be significant

Shanghai Case Study:
Annual avoided costs from DR could reach 811.2 million RMB in 2030



Source: NRDC-Oxford University Study

Take-aways

- Power sector transition provides opportunities for upgrading to the NextGen DSM
 - Consumers
 - Grid Companies
 - Nontraditional industry players
- Now is the time to fully prepare for the market to launch
 - City and provincial governments are taking the lead
 - So are third party service providers, recognizing first mover advantage
- But development of sustainable business models and enabling policy and regulatory mechanisms are critical

Food for thought:

China has all the ingredients for the recipe for success, having

- surpassed the world in renewable energy capacity development
- overtaken the U.S. in electric vehicle sales
- set aggressive carbon reduction targets, and
- paved the way toward establishing a new power market

Can China become the superpower of NextGen DSM?

THANK YOU!



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