

# Demand-Side Resource Potential Analysis Methods and Application

## City of Huzhou in the Yangtze River Delta Case Study

### Power Sector Roundtable Report Series

June 2020

#### A New Era for Power System Development

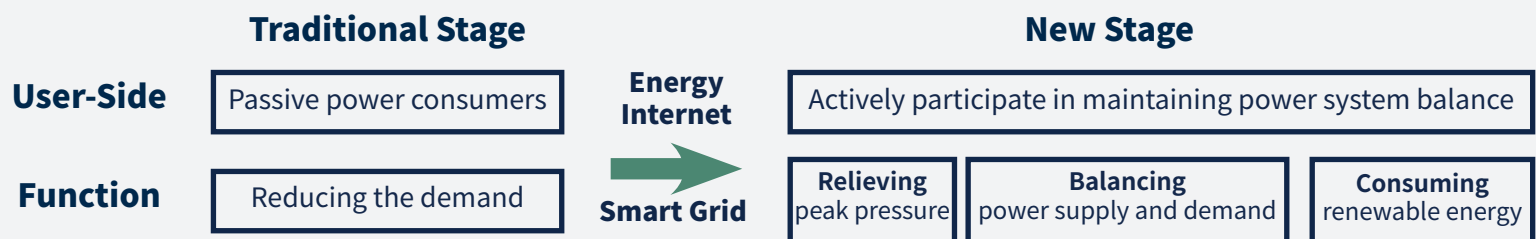
##### Power systems are undergoing a comprehensive transformation

- Large-scale renewable energy is being connected to the supply-side and the user-side is trending towards diversification.
- Power systems are shifting from a one-way flow of electricity towards a bi-directional flow of electricity and from "supply determining demand" towards a highly coordinated matching of supply and demand.

##### Power system development is entering a new stage

- China's economy has entered a "new normal" of "improving quality and efficiency" and power systems have likewise entered a new stage of "low-carbon transition and high-quality development".
- Overall power supply capacity is generally sufficient, however in some regions power shortages have become a more prominent problem. Electric energy replacement and renewable energy are reshaping modes of power consumption.

#### A New Stage of Development for Demand-Side Resources



#### Analysis of Demand-Side Response Resource Potential in Huzhou

##### Demand-Side Response Resources Potential Accounting

###### Macro level

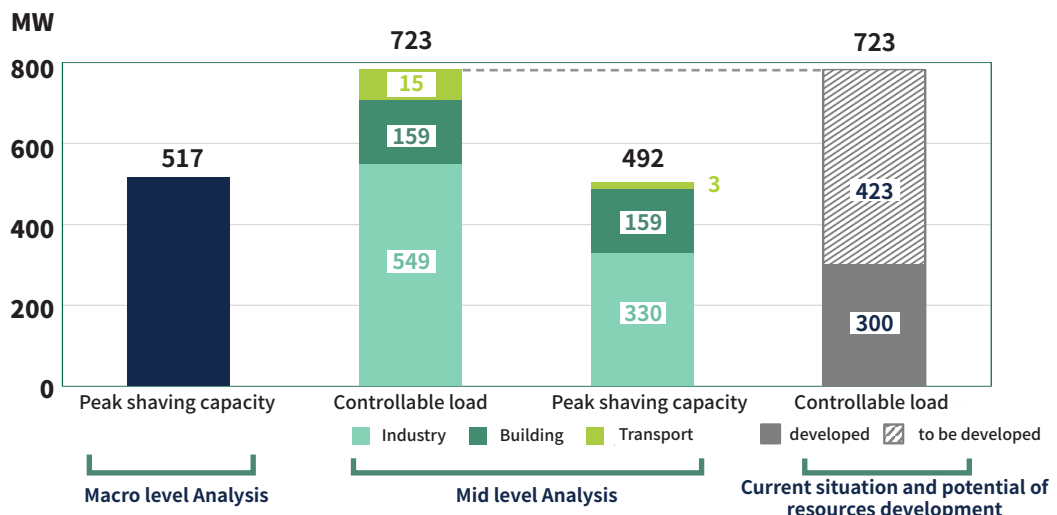
Use "the proportion of adjustable load to the maximum load in the region" as an indicator.

###### Mid level

Use "industrial maximum regulation capacity", "industry participation", "industrial adjustable load" and "industrial peak shaving capacity" as indicators.

###### Micro level

Total demand response resources are equal to the sum of the capacity of all users to directly regulate and transfer loads in the region.



- Huzhou is expected to have a demand-side regulation capacity of 14% of its maximum power load (2019);
- The demand response resources to be developed in Huzhou are mainly concentrated in the commercial air conditioning, textile, and equipment manufacturing sectors, each totaling over 90 MW.

## ■ A "Four- Quadrant" Analysis of Demand Response Resources

### Regional demand response resources potential

Determining Factors

#### Regulation Capacity

Determined by users' load characteristics

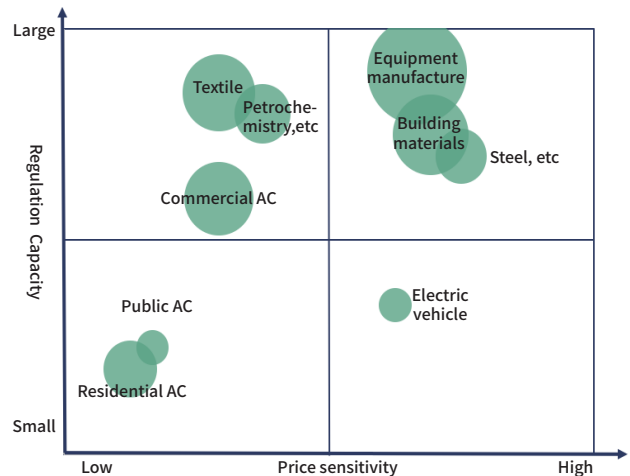
#### Price Sensitivity

Customers' responsiveness to tariff changes or incentive signals

In order to maximize efficiency, it is recommended that the order of regional development demand response resources be:

**A resources > B resources > C resources > D resources**

"Four- quadrant" analysis results for demand response resources in Huzhou's key areas



## Policy Recommendations



### Strengthen policy support for and effectively improve the strategic position of demand-side resources.

- Promote comprehensive energy resource planning and design to strengthen the role of demand-side resources.
- Improve pricing and incentive mechanisms to guide the role of user-side resources.
- Strengthen the oversight system to ensure the rational development and utilization of demand-side resources.



### Incorporate demand response as a key element of the "new power infrastructure" in order to realize intelligent regulation of demand response resources.

- Cultivate the market for power data elements and lay a data foundation for the implementation of demand response.
- Develop an interactive demand response information platform to empower demand response resources.
- Speed up the development of a standard system for demand response resources.



### Promote improving the electricity market and use the role of demand-side resources to balance electricity supply and demand.

- Actively cultivate various market players to utilize demand-side resources.
- Accelerate the establishment of the spot energy market and the ancillary service market.
- Establish a normalization mechanism for demand-side resources to participate in the market.
- Promote demand-side resources to integrate new energy into cross-regional transactions.



### Strengthen research on potential exploration and provide theoretical support for demand-side resources development.

- Strengthen basic research on demand-side resource potential analysis.
- Closely integrate new information technology to improve the accuracy of demand-side resource assessment.
- Strengthen the application of demand-side resource analysis and research results.



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