2016.10.13

HONEYWELL ADR

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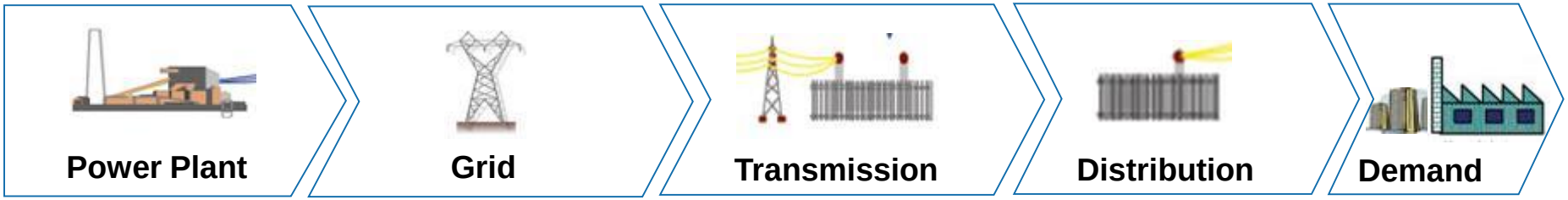
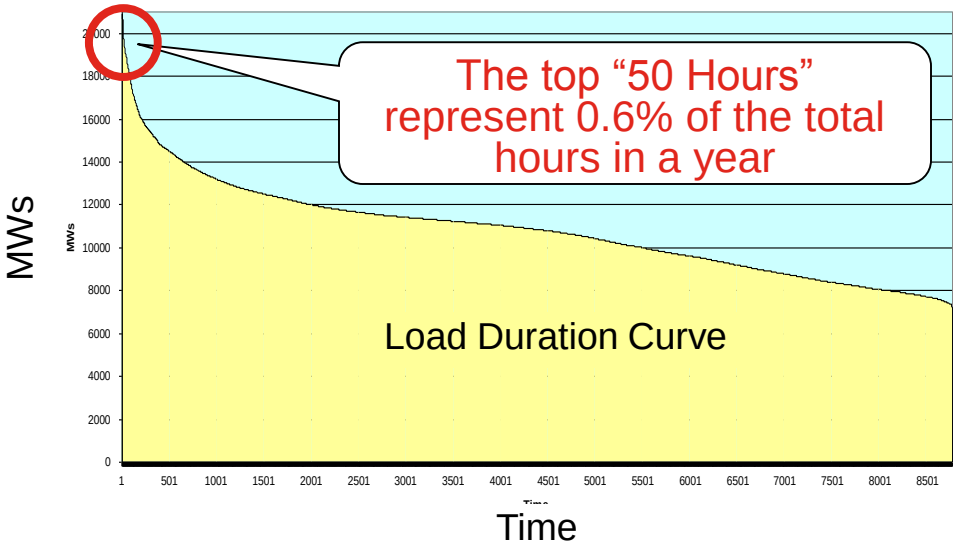
Why DR? Electric Demand is Highly Variable



Highest demand occurs on only a few hours in the year



Possibility of over investment

- Supply > Demand
- Variable demand over time
- Grid infrastructure built according to the maximum load
- In-efficient power investment for peak load (~$600k/kw for coal plants, not including grid, T&D)

Significant Generation Built for Only Few Hours

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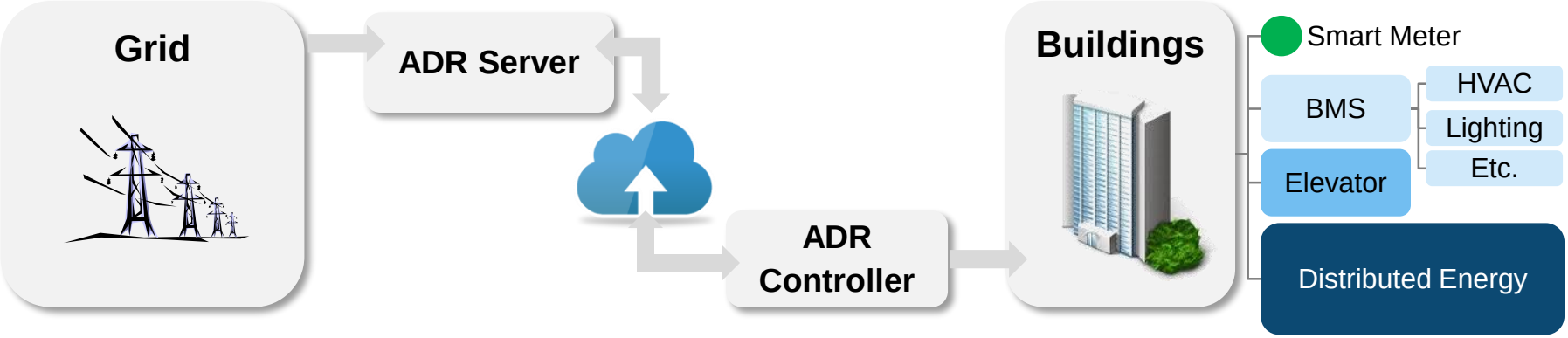
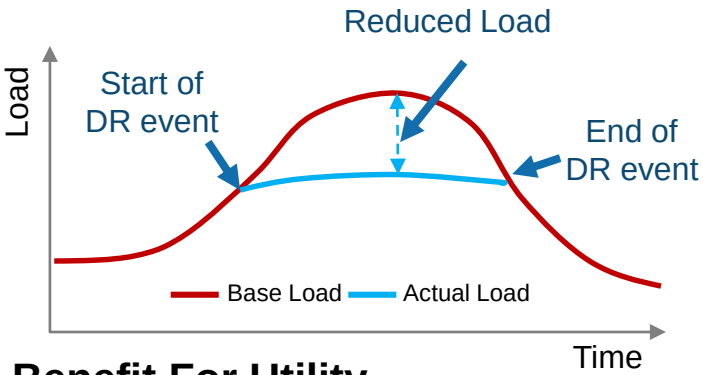
What Is Automatic Demand Response (ADR)?





Benefit For Utility

- Two-way interaction
- Improved stability, supply & demand balance
- Avoid buying expensive external power
- Better work with intermitted renewable energy
- Reduce electricity investment

Shed Potential

Building Type	Average Load Shed
Hotel	15%-20%
Hospital	7%-15%
Real Estate	10%-15%
Commercial Building	15%-20%

Gov't Subsidy Case

	Notice Time	RMB/ kW
Manual	24h	80
	4h	100
	30min	120
Auto		160

Benefit For Building

- Reduced equipment investment
- Reduced energy bill
- Avoid peak price
- Subsidy from gov't for DR event

High Efficient Load Shed

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2012 Smart Grid ADR Demo Project

2009.12

US-China Energy Corperation Program (ECP) signed by President Hu & Obamba on clean energy technology cooperation

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2009.10-11

Bilateral Memo signed by relevant government departments

2011.2

State Grid and Nat'l Energy Administration approved ADR project feasibility study

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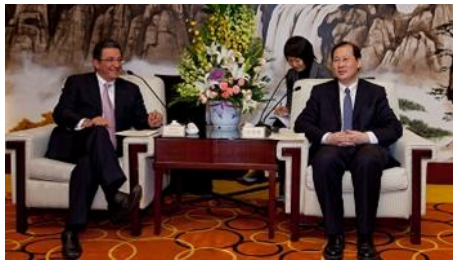
2012.1

Cooperate with Tianjin TEDA to kick off the first automatic demand response demo project



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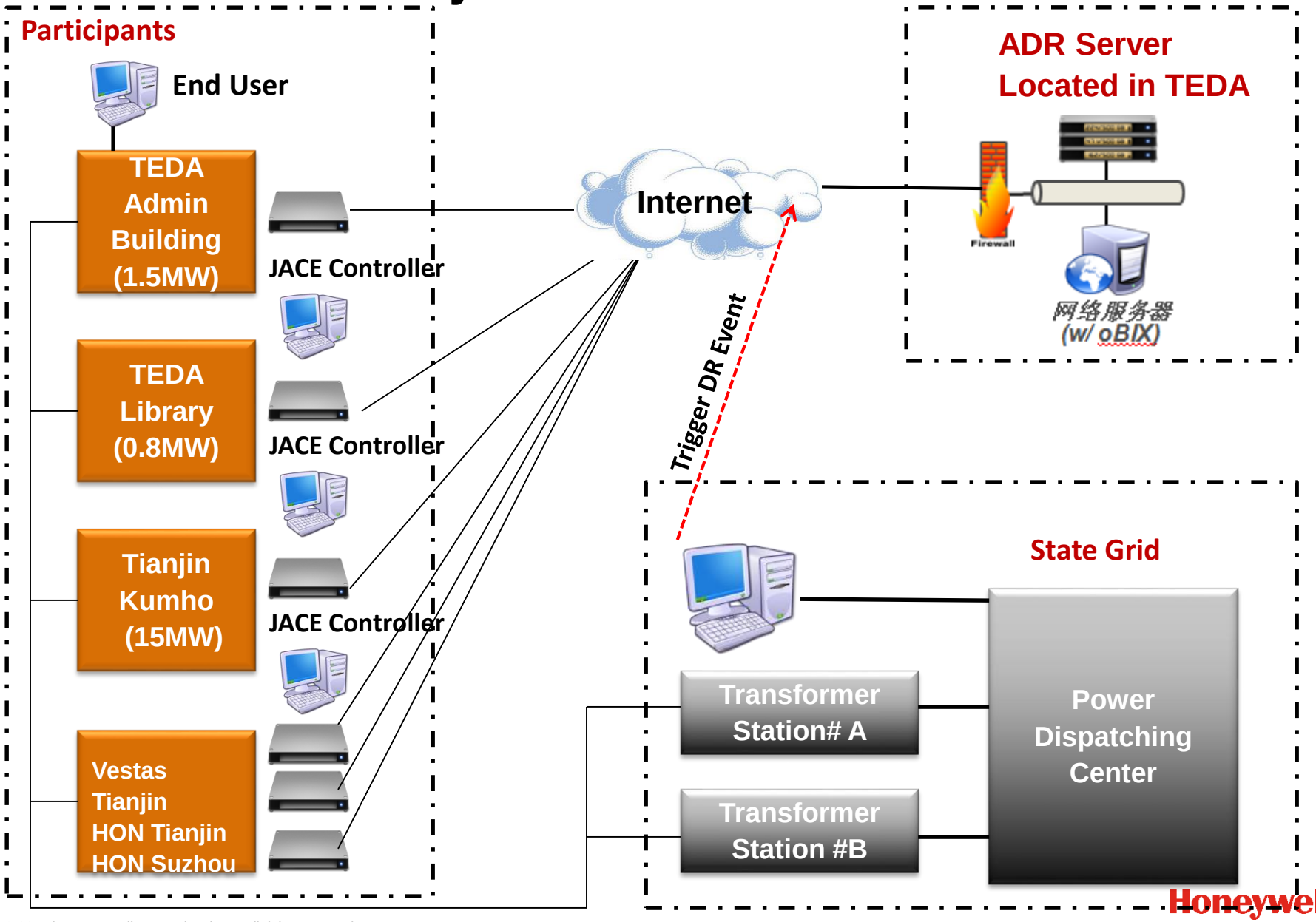
ADR Demo Project Architecture



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Device Connected In Tianjin Demo

Buildings

TEDA Library

TEDA Admin Building

Tianjin Vestas

Kumho Tyre

Honeywell Suzhou

Honeywell Tianjin

Device Connected

- Air con
- Lighting
- Elevator
- Motor
- Renewable Energy
- Machines
- Electric Equipment
- Ventilation
- Others

DR Examples

Turn-off 1 of 4 elevators

Start Backup Generator

Pre-cooling building early morning

Turn-off non critical lighting

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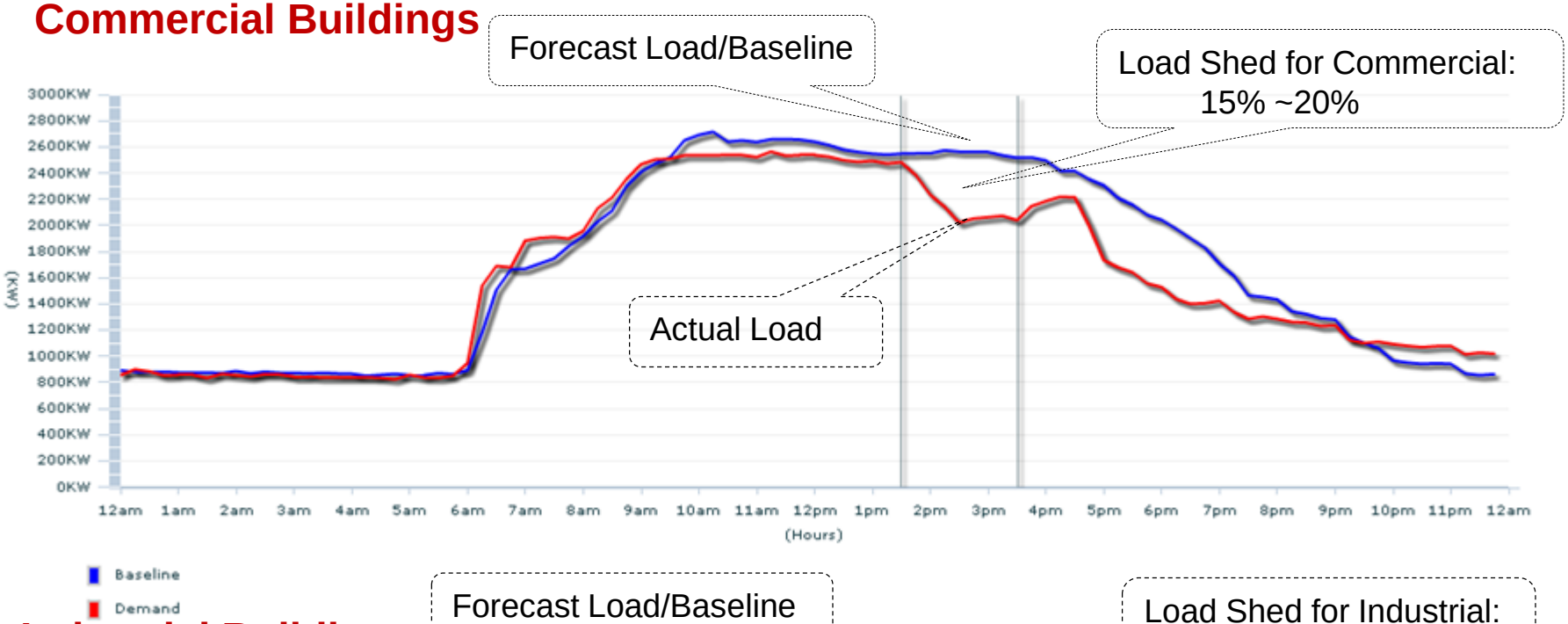
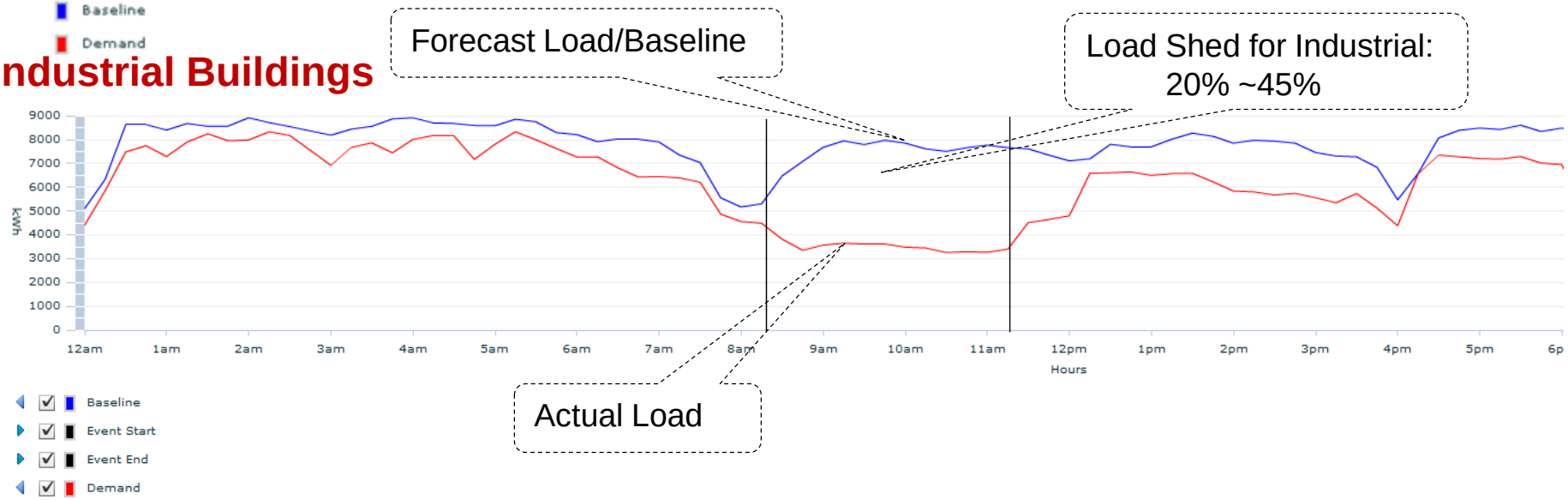
TEDA Demo Results

Commercial Buildings



Industrial Buildings



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