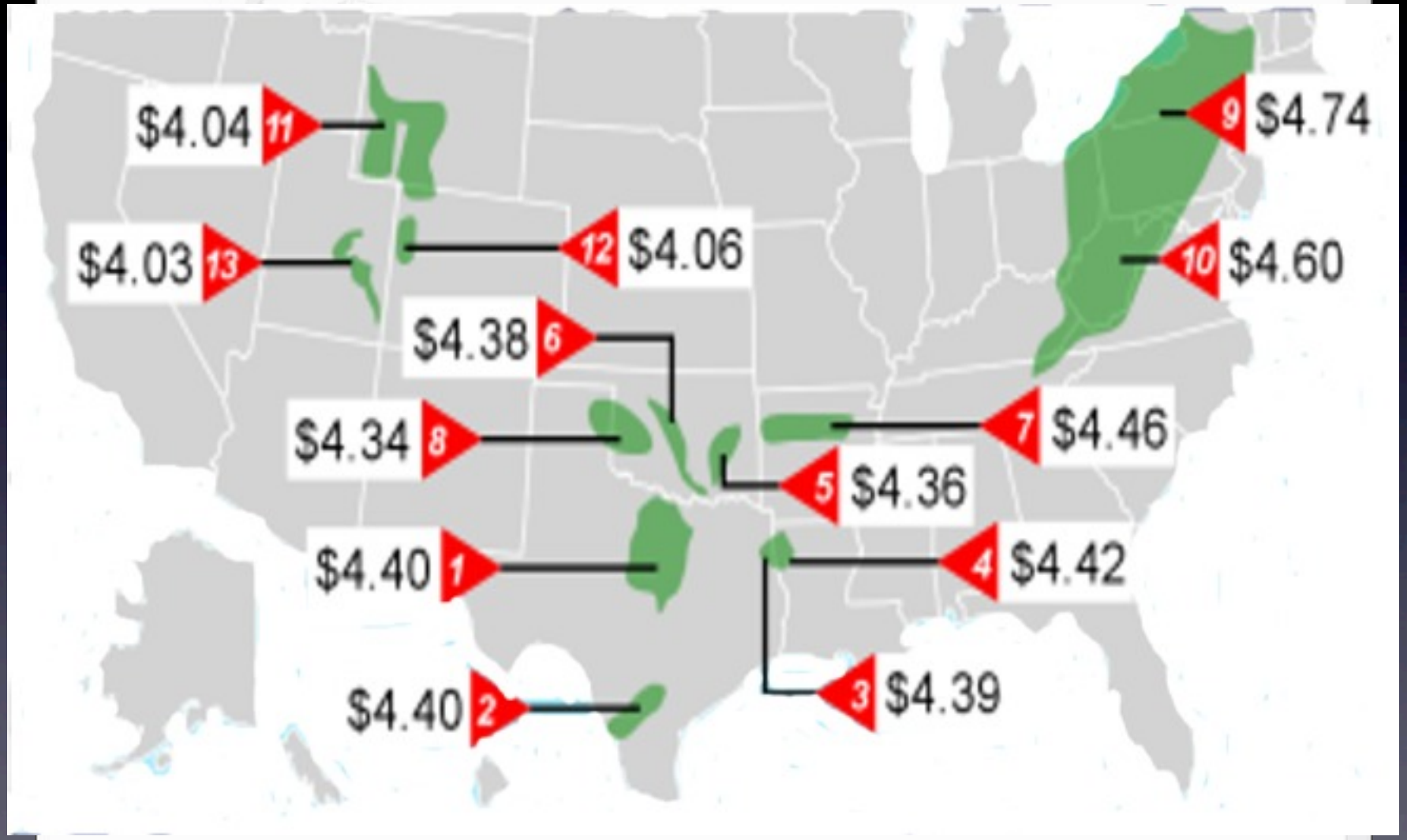
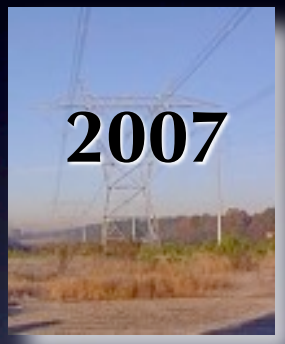
# Northern California Power Agency
# 2011 Annual Conference

## Napa, CA
## September 22, 2011



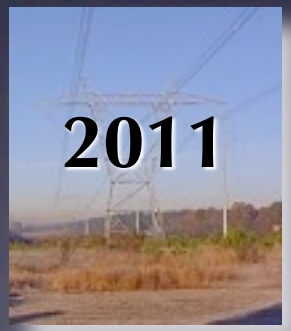

Source: Ventyx , Velocity Suite April 2011


Order No. 888



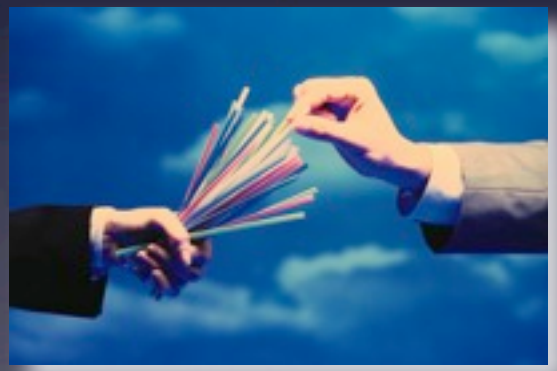

Order No. 890

Order No. 1000



Planning

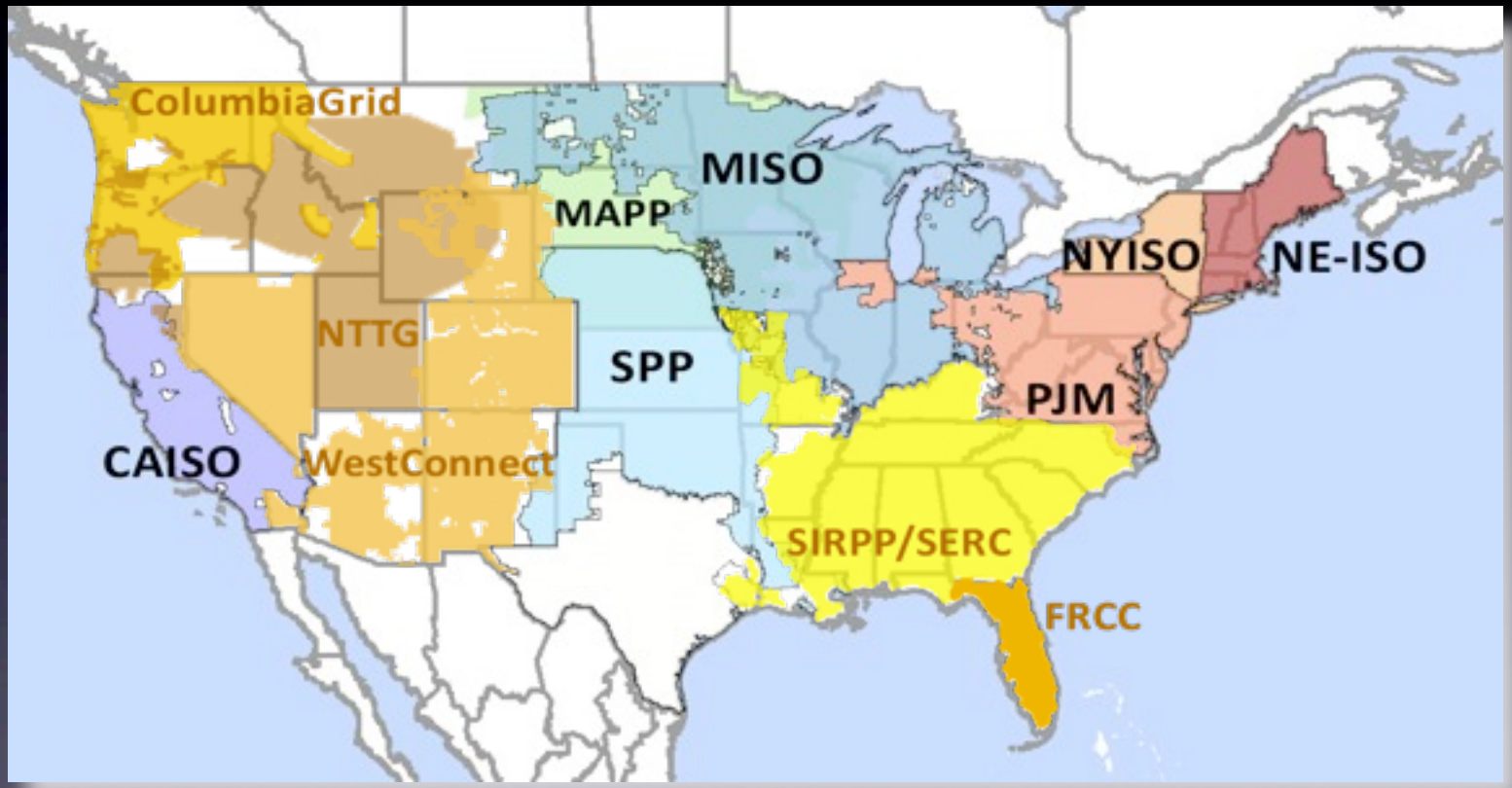
Incumbent Developer Issues



Cost Allocation

Siting

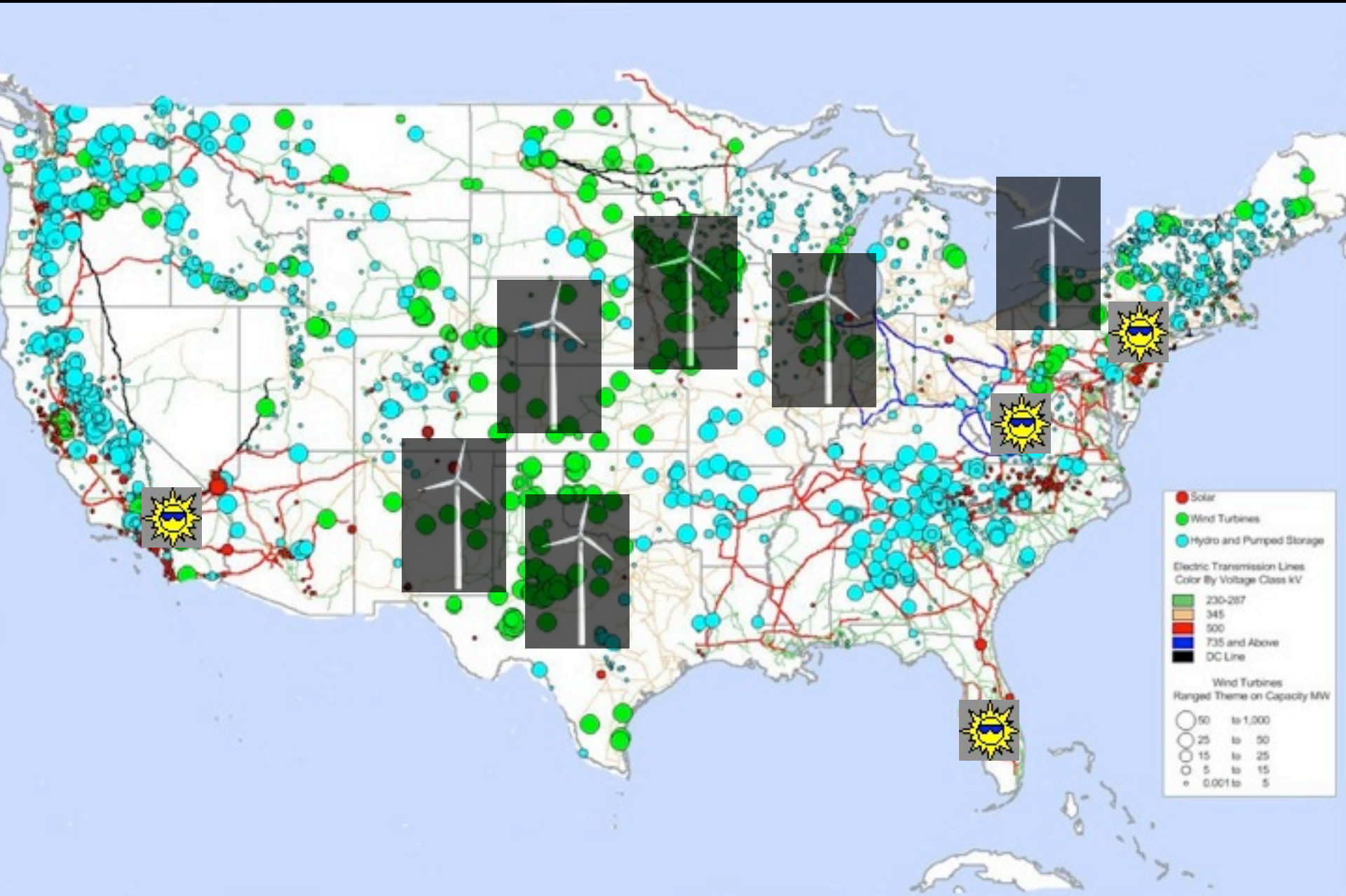
# Current Transmission Planning Regions




- This map is for illustration purposes only. This map generally depicts the borders of regional transmission planning processes through which transmission providers have complied with Order No. 890. Those borders may not be depicted precisely for several reasons (e.g., not all transmission providers complying with Order No. 890 have a defined service territory). Additionally, transmission planning regions could alter because transmission providers may choose to change regions.

**Source: Derived from Energy Velocity**

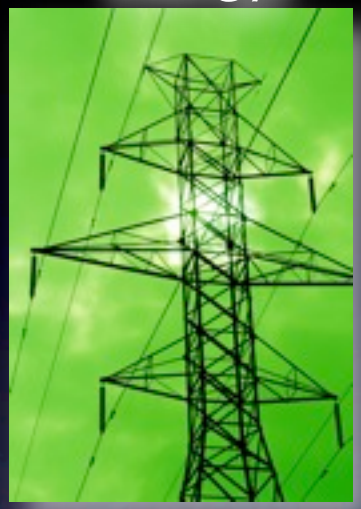

# "Transmission planning for a reliable, economic and open grid…"


Solar
Wind Turbines
Hydro and Pumped Storage
Electric Transmission Lines
Color By Voltage Class kV
230-287
345
500
735 and Above
DC Line
Wind Turbines
Ranged Theme on Capacity MW
50 to 1,000
25 to 50
15 to 25
5 to 15
0.001 to 5


MONOPOLY
INCOME TAX
CHANCE

# GreenBiz - VERGE

Energy

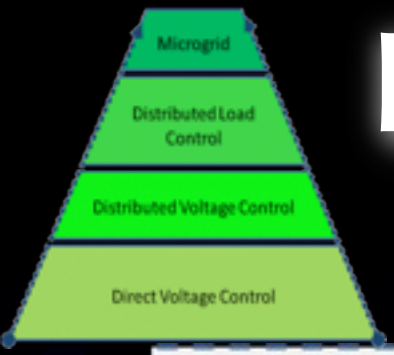


Information


Buildings

Vehicles

# Dominion MicroGrid Vision




Regional Transmission Operator (RTO)

Dominion Substation E-Grid Database
Electrical GIS

System & Regional Operations Center
B G L

Billing
Back Office
Customer
Bills

Military, Commercial, Industrial Microgrid

Utility Defined Microgrid

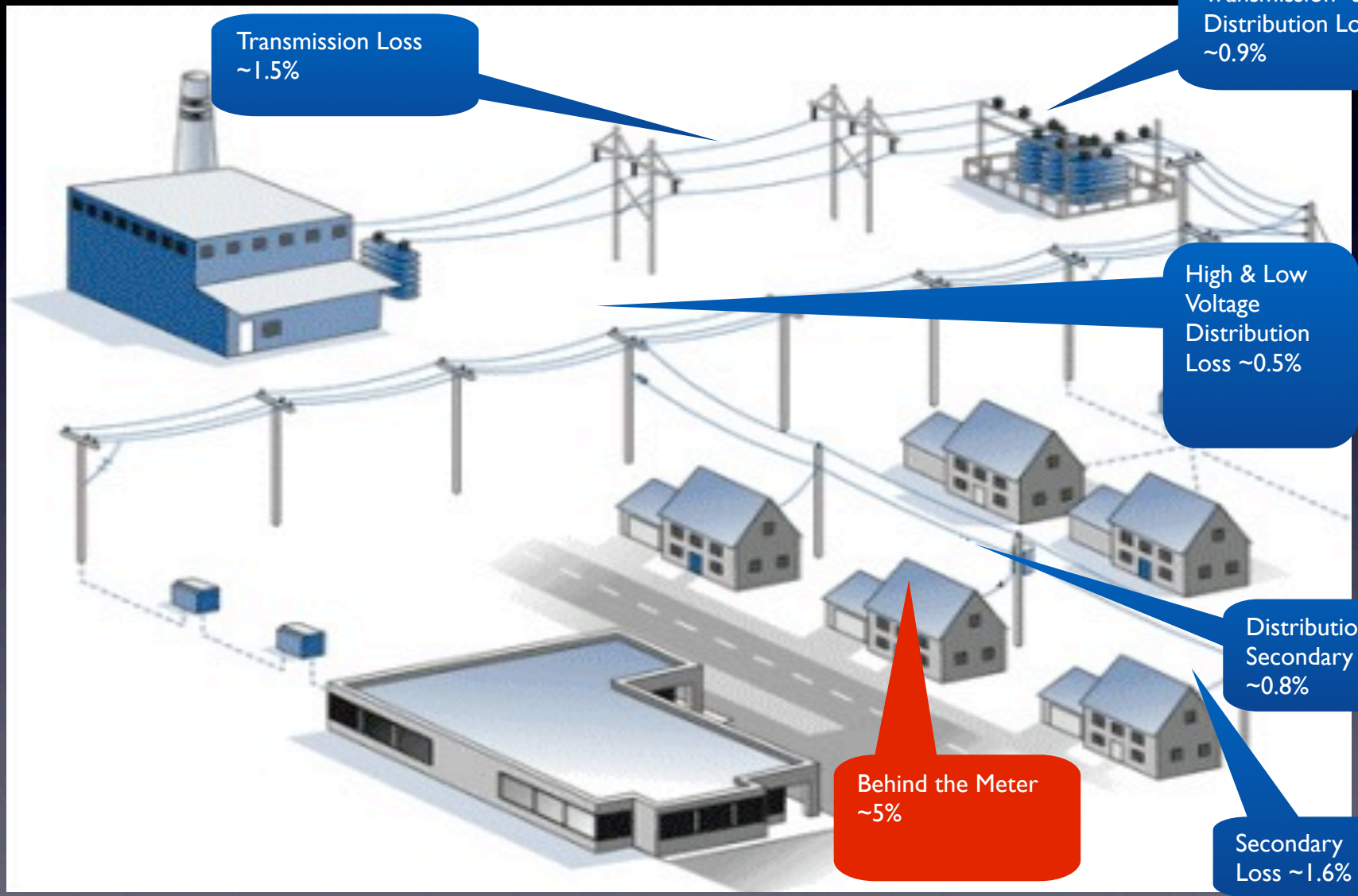
Home Microgrid

AMI

Dist Storage

# The Hunt for Transmission and Distribution Losses

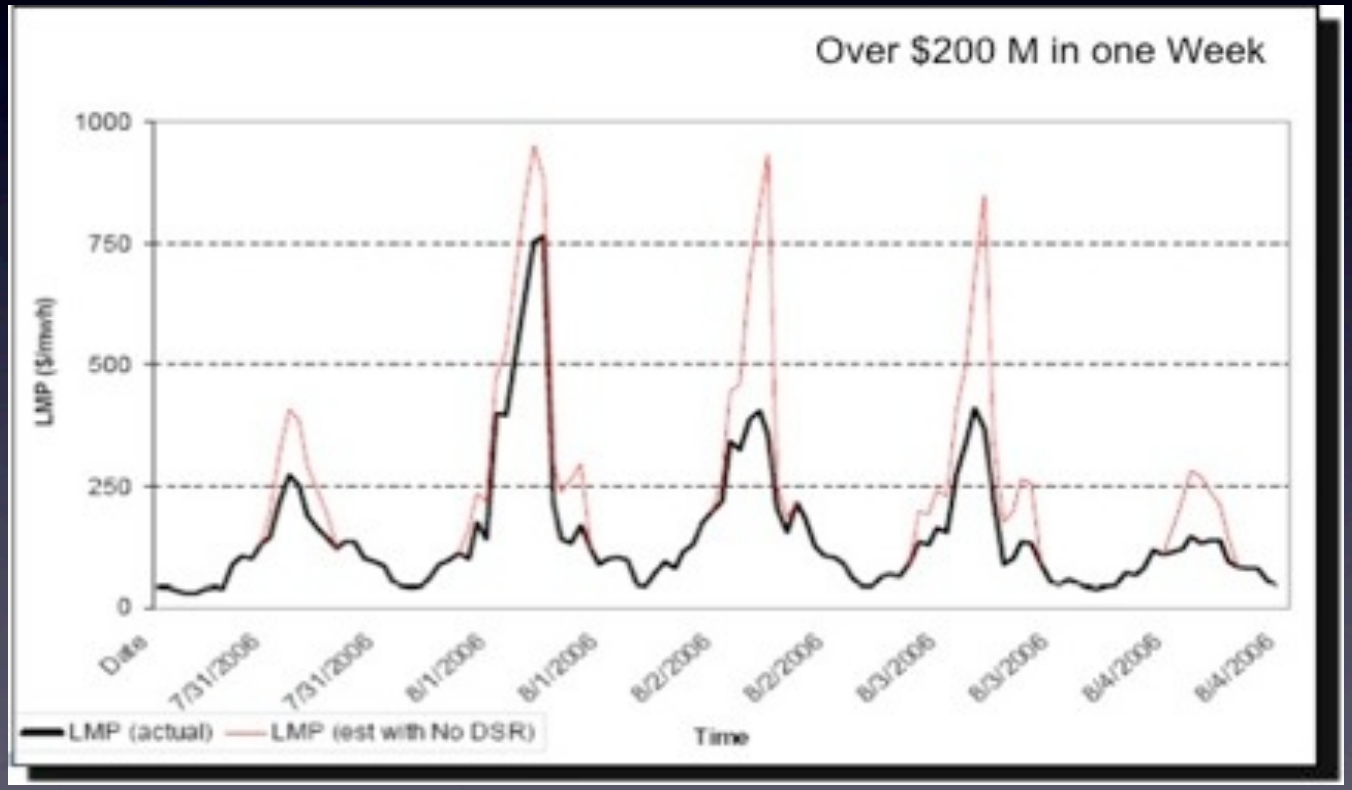
**2010 Electric System Loss ~ 10.3%** **Includes Transmission, Distribution and "Behind**



# Grid Benefits of Demand Response

* PJM Study- a 3% Reduction in Demand of Top 20 5hr Blocks in 5 Mid-Atlantic States Could Save $280 Million annually

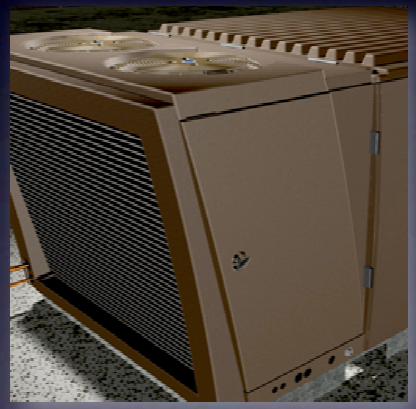
* Brattle Group- a 5% Reduction in Grid Peak Load (757 GW) Can Result in $3 Billion Savings Annually, for PV Over 20 Yrs of $31 Billion




BUILDING

# Transactive Load

ETS Heat

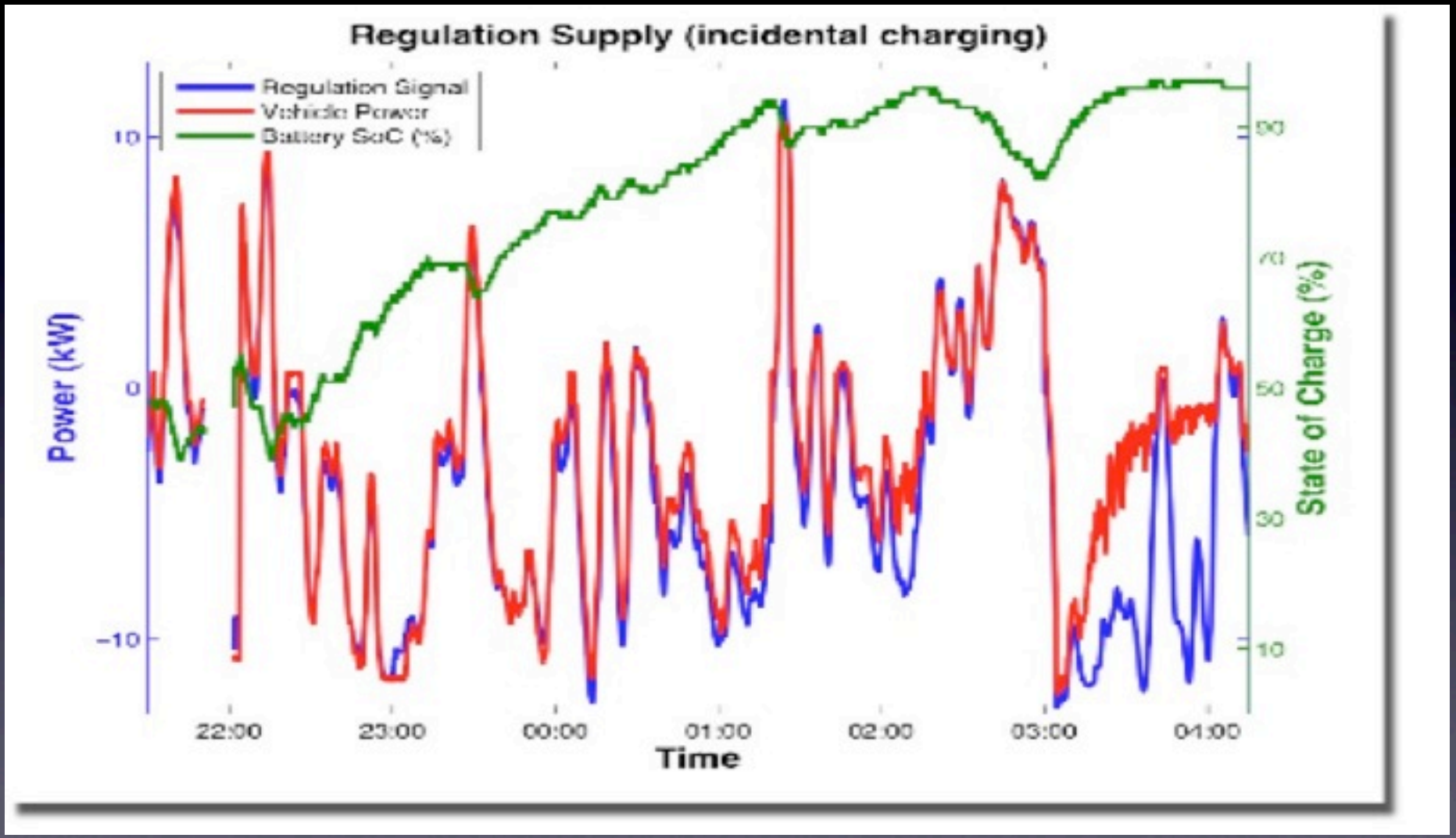


Ice-based AC

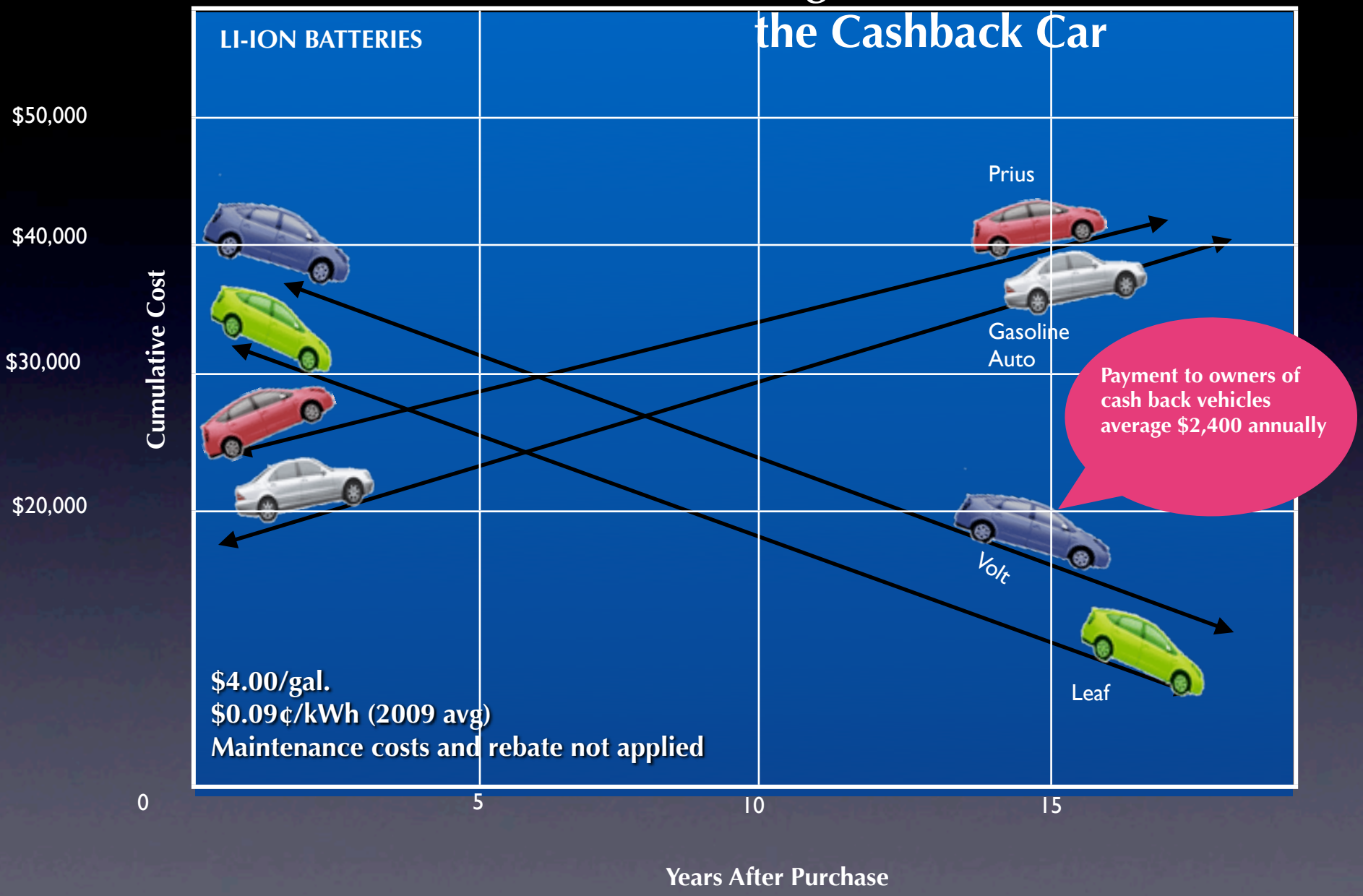
EV

Source: VCharge


Pepco Holdings Inc
V2G
pjm


Regulation Supply (incidental charging)
Regulation Signal
Vehicle Power
Battery SoC (%)
Power (kW)
10
0
−10
State of Charge (%)
90
70
50
30
10
22:00
23:00
00:00
01:00
02:00
03:00
04:00
Time

# Regulation Services and the Cashback Car




Thank you!