Welcome, and thank you for joining us!

IT'S ON

DRIVING ELECTRIC HAS NEVER BEEN EASIER

Agenda

PYD Overview

Chargers

Building Blocks

Panel Q&A

1 2 3 4 5 6 7 8

Welcome and logistics

Rate Models

Architecture

Future Use Cases
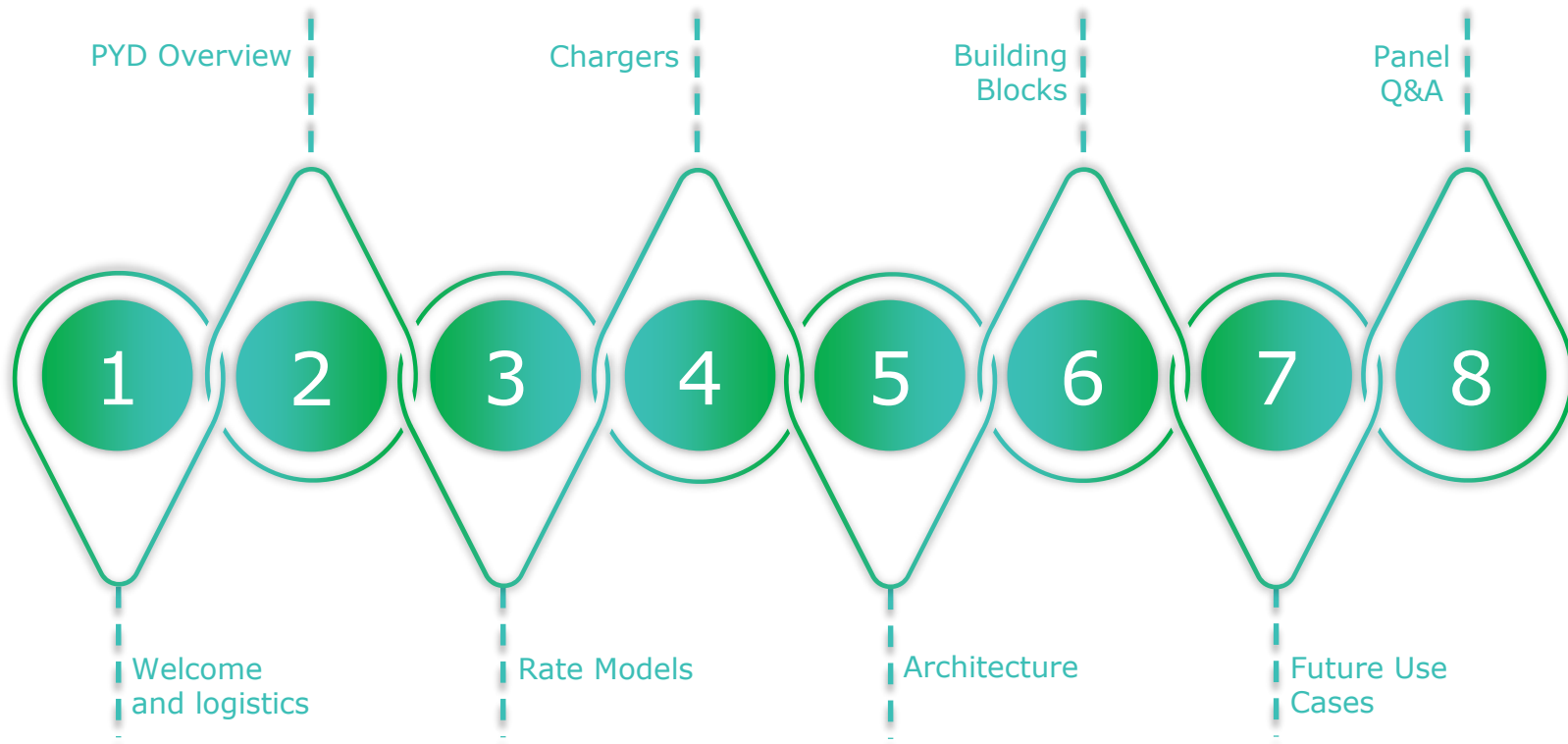
Power Your Drive
Overview

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Power Your Drive Overview

Installed, owned, operated, maintained, and billed by SDG&E, at no additional cost to the site host

EV Chargers

3,040 electric vehicle charging nozzles; 33% no cost chargers in disadvantaged communities

Building Types

Charging Made Easy

78% of the energy delivered through the program comes from renewable resources

Reducing Grid Impact

Clean Energy

254 businesses, condos, and apartments with 39% of sites in multi-unit dwellings

An hourly rate encourages EV charging during the cheapest off-peak times

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Power Your Drive Overview

989 MT of GHG emissions reduced, equivalent to 33,823 trees

Average rate of 21¢ / kWh compared to residential average rate of 27 ¢ / kWh[2]

Eliminated ~350,000 Gallons of Gasoline

8,679,281 Electric Vehicle Miles Enabled

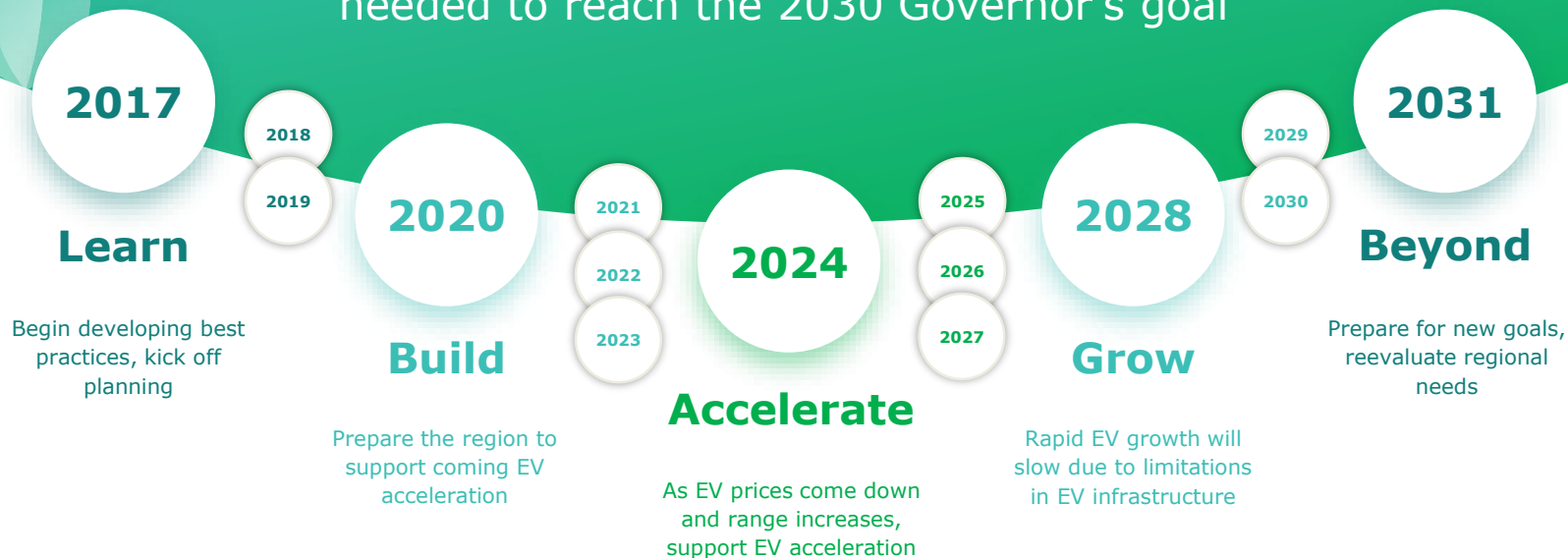Customers saved over $500,000 in fuel costs

1,829 drivers influenced to purchase or lease an EV because of Power Your Drive[1]

86% of kWh usage during Off-Peak and Super Off-Peak hours, 73% renewable

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Data as of 1/31/2020
[1] Incremental purchases based on new drivers at a site 90 days after completion
[2] Residential Average kWh price from AL 3487-E

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Power Your Drive Overview

SDGE

A Sempra Energy utility®

Forecasted trends in electric vehicle sales and infrastructure
needed to reach the 2030 Governor's goal

2017
2018
2019
Learn

Begin developing best
practices, kick off
planning

2020
2021
2022
2023
Build

Prepare the region to
support coming EV
acceleration

2024
2025
2026
2027
Accelerate

As EV prices come down
and range increases,
support EV acceleration

2028
2029
2030
Grow

Rapid EV growth will
slow due to limitations
in EV infrastructure

2031
Beyond

Prepare for new goals,
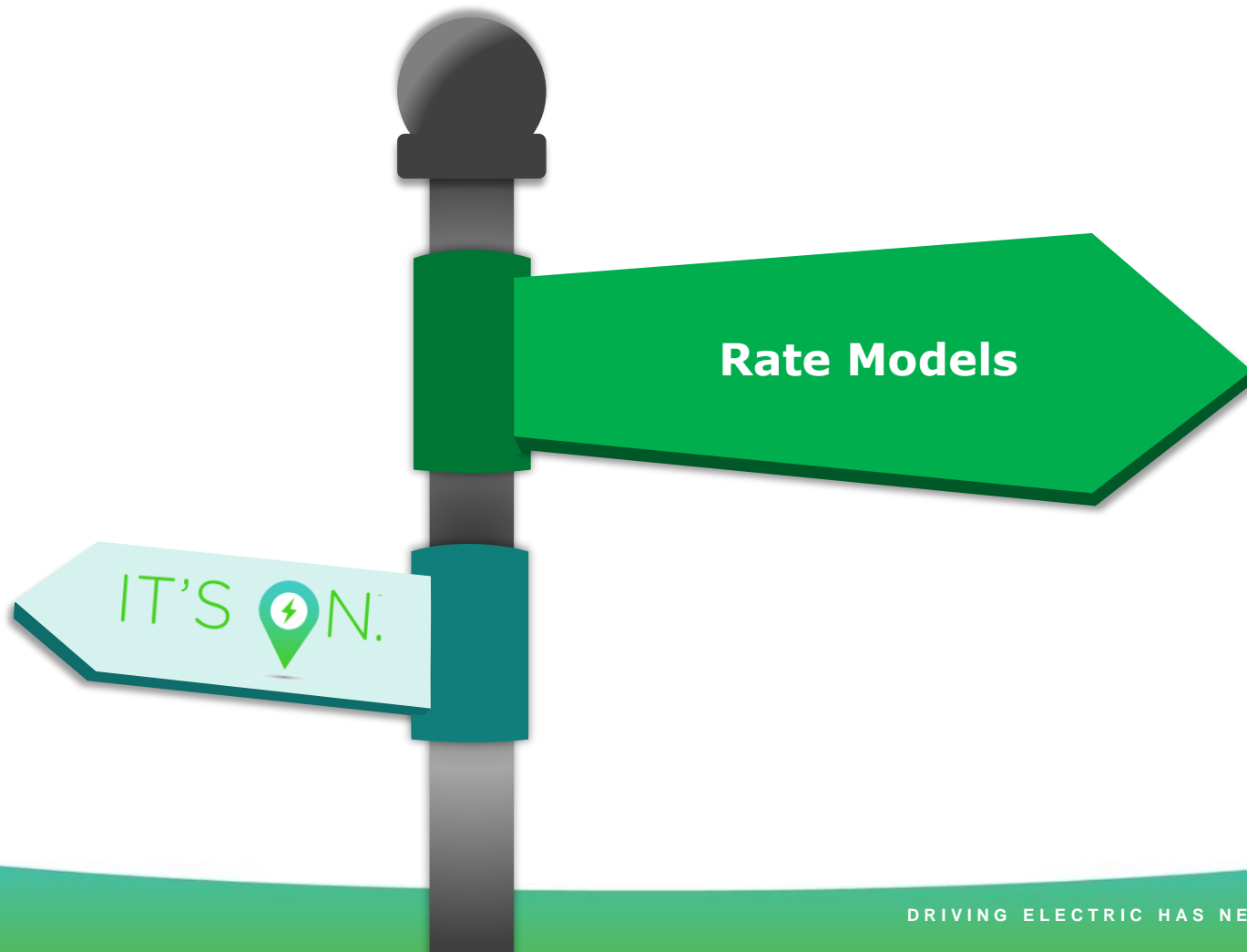reevaluate regional
needs

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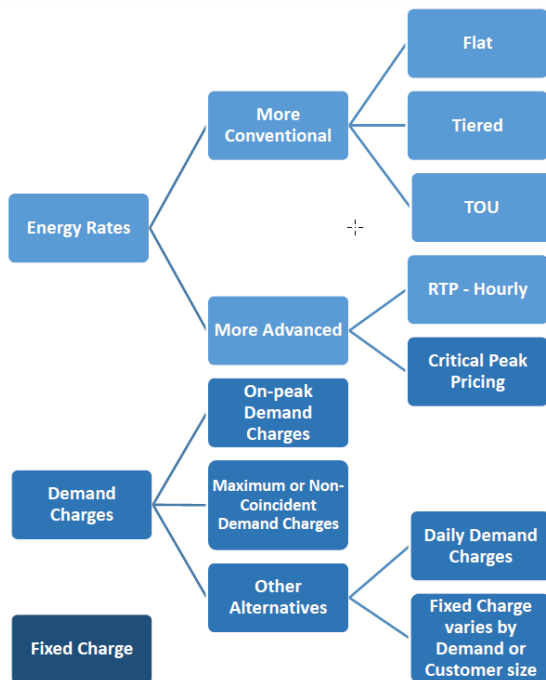
Power Your Drive Award

SDG&E has won the 2020 title of "Investor-Owned Utility of the Year" for our work on Power Your Drive

Rate Models

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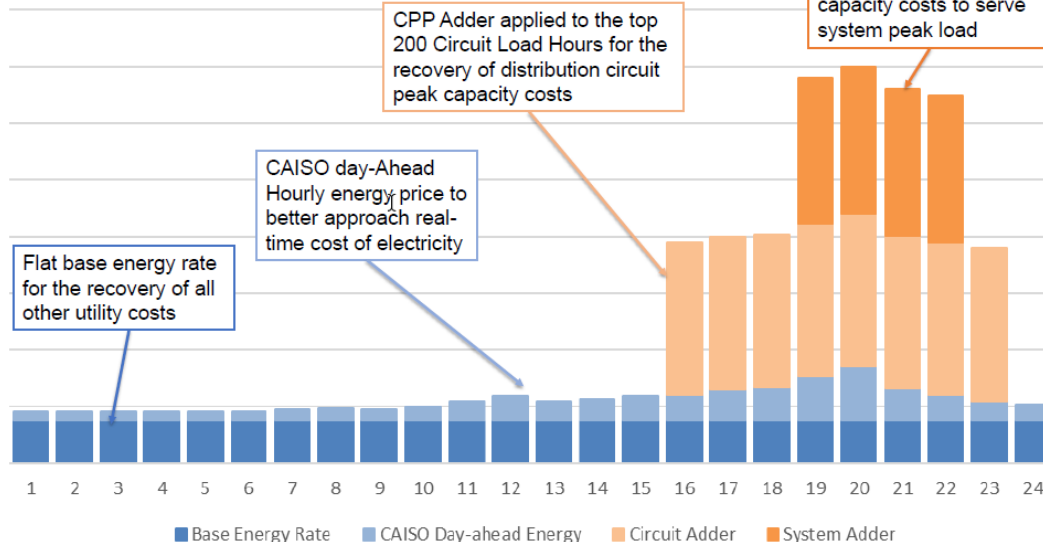
Next-Generation Cloud Applications: Grid based EV rates

Energy Rates
- **More Conventional**
  - Flat
  - Tiered
  - TOU
- **More Advanced**
  - RTP - Hourly
  - Critical Peak Pricing

Demand Charges
- On-peak Demand Charges
- Maximum or Non-Coincident Demand Charges
- Other Alternatives
  - Daily Demand Charges
  - Fixed Charge varies by Demand or Customer size
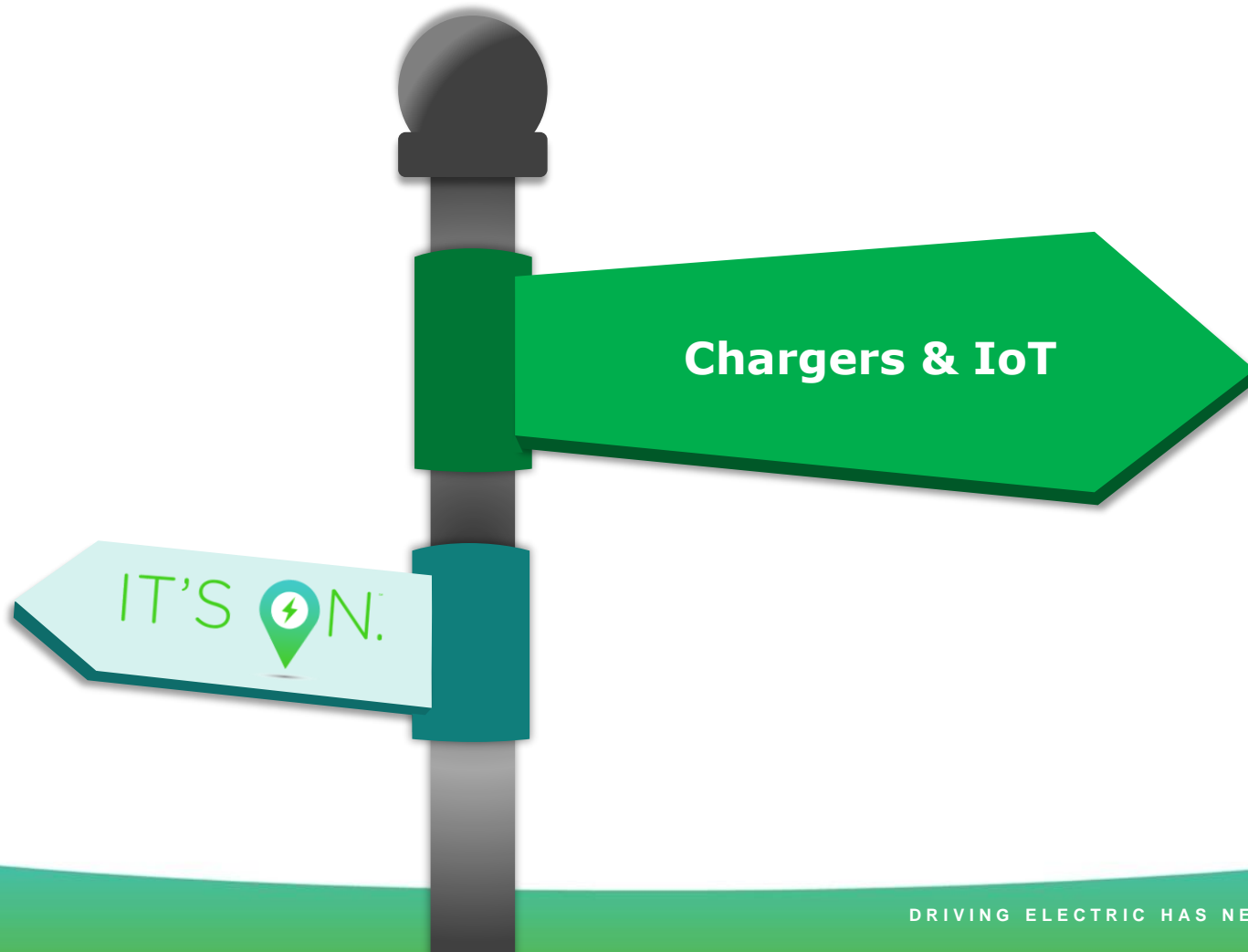
Fixed Charge

Advanced technologies partnered with more complex and granular rate design can create more opportunities for low cost hours
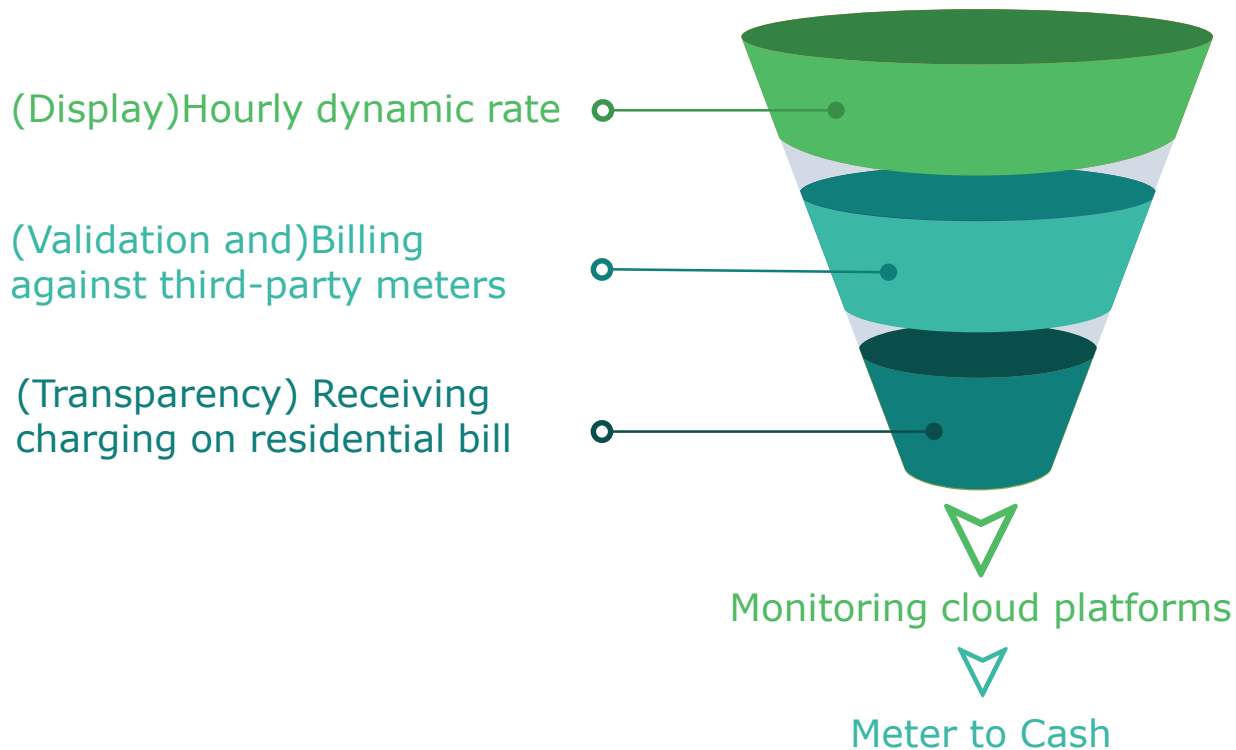
Illustrative Hourly Dynamic Rate

CPP Hourly Adders applied to the top 150 System Load Hours for the recovery of generation capacity costs to serve system peak load

CPP Adder applied to the top 200 Circuit Load Hours for the recovery of distribution circuit peak capacity costs

CAISO day-Ahead Hourly energy price to better approach real-time cost of electricity

Flat base energy rate for the recovery of all other utility costs

Hours: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Legend: ■ Base Energy Rate ■ CAISO Day-ahead Energy ■ Circuit Adder ■ System Adder

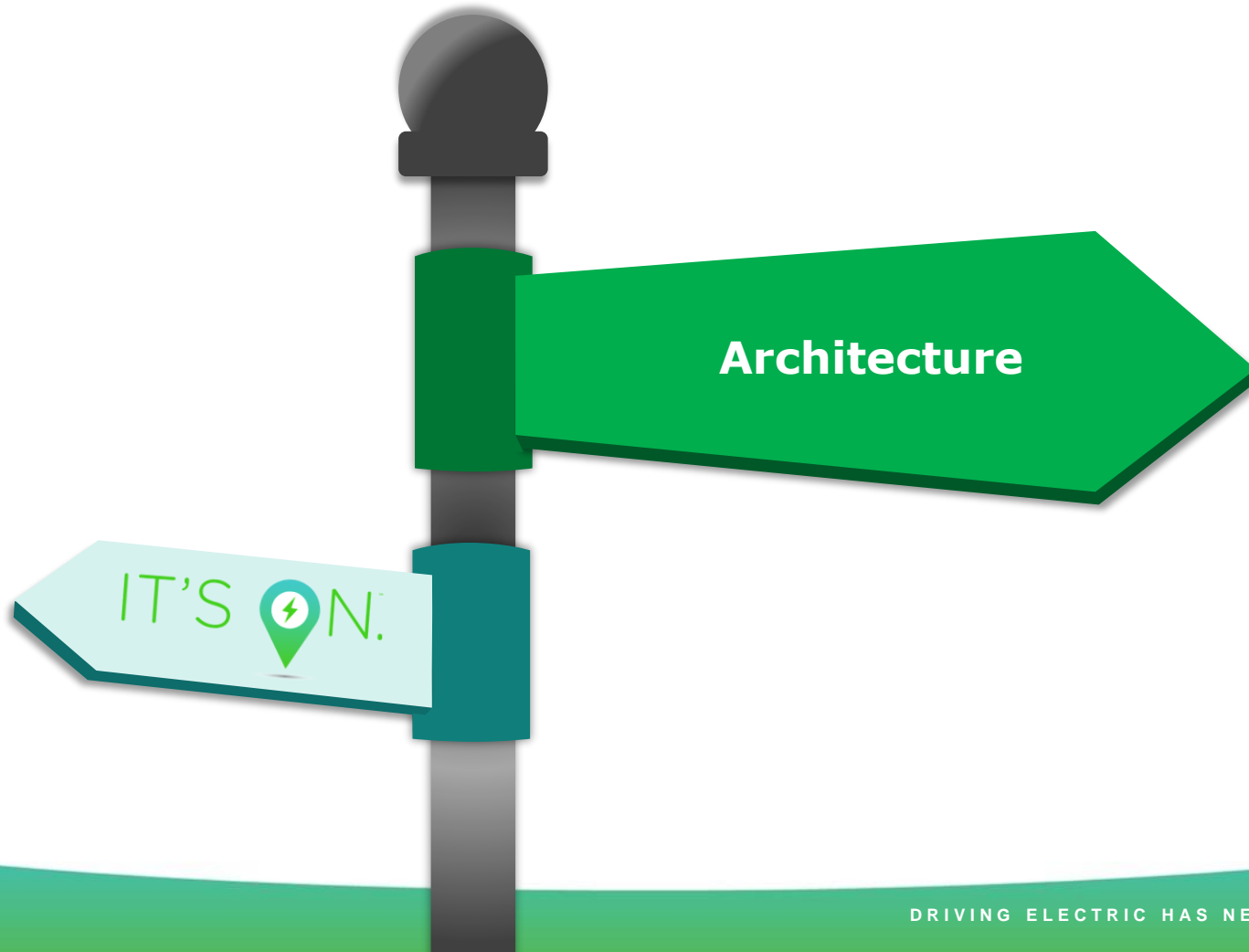*CPP* is an energy rate option that provides a "capacity" price signal

Circuit-level CPP provides a locational price signal while preserving customer equity by still charging all customers the same price

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Next-Generation Cloud Applications: Grid-Based EV Rates
Rate Models

(Display)Hourly dynamic rate

(Validation and)Billing against third-party meters

(Transparency) Receiving charging on residential bill

Monitoring cloud platforms

Meter to Cash

Architecture

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Data Streams

State machines

Function as a Service Calc Engine

Plug-n-play

Interoperability

Market Positioning

Capitalization

Privacy

Monitoring

Simplified View – Building Blocks

On-Premise services	API Gateway	Cloud based services	Hybrid Cloud Model

Digital services	Asset (/MD) Management	Centralized Monitoring	Network Management
GIS, Map overlays	Calculation Engine	Validation Estimation Editing (VEE)	Charger Interrogation
Customer Engagement	Billing, Invoicing	CIS, CRM, Enrollment	Meter Interrogation

Charging Reference Architecture
Value, Integration, & Physical Layers

Value Added Services Layer

Pricing Services	Parking Charges	Fleet Services	Billing Services	Network Management	Authentication Services

Integration Services Layer

Open Charge Point Protocol	Vendor Proprietary Interfaces	Advanced Meter Infrastructure	Reliability	Site and Facility Metadata

Physical Layer

Charger [Nozzle]	Smart Meter Electrical Meter	Communication Modules (WiFi, Bluetooth, RF Gateways)	Range Extender

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Q&A/Discussion
Thank you for your time.

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