SUCCESSFULLY INTEGRATING DISTRIBUTED ENERGY RESOURCES

NYSERDA'S ON-SITE RESILIENT POWER CONFERENCE

JUNE 27, 2019

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NAVIGANT
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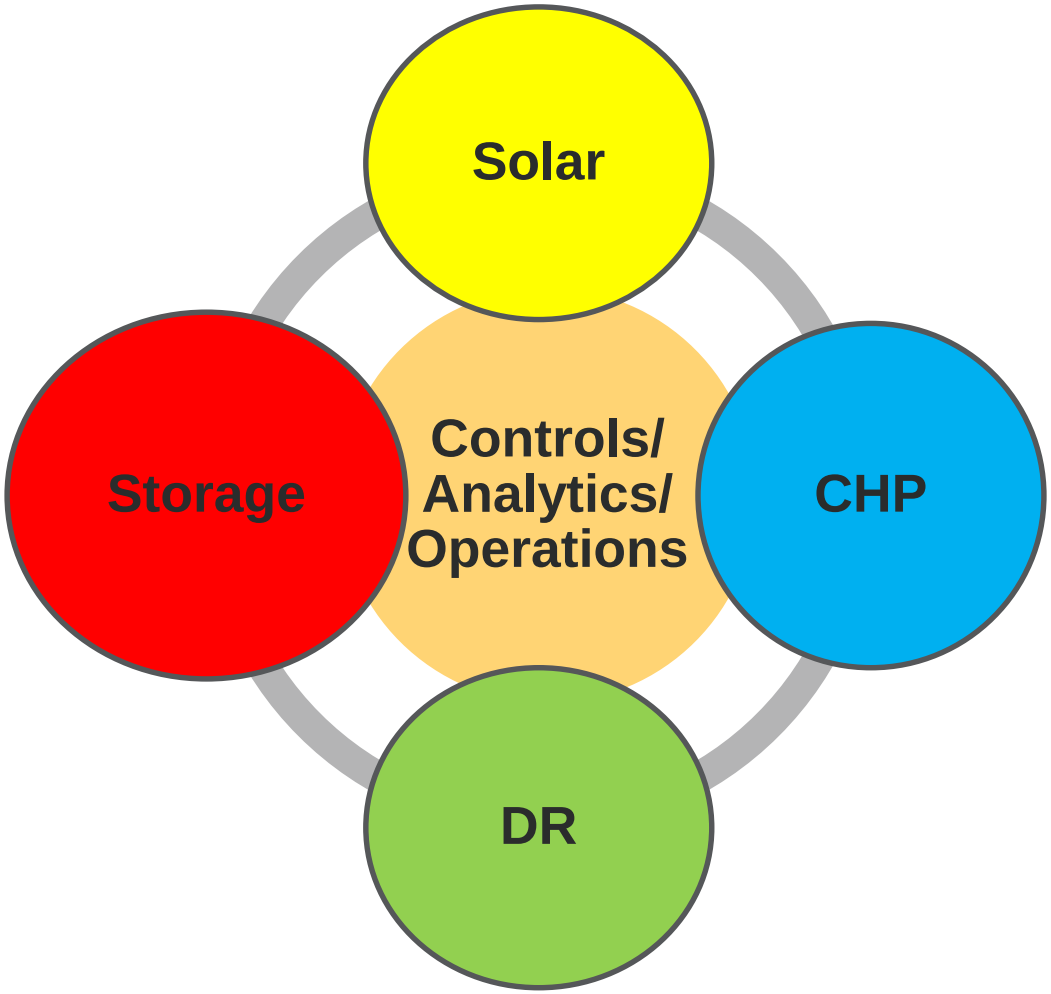
WHY ARE WE HERE?



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AGENDA

Traditional DER Silos, the Goal of Integrated DER, and Customer Needs

Barriers to Integrated DER Implementation

Software Platforms Can Help Overcome the Barriers

New DER Business Models

TRADITIONAL DER SILOS

Distributed Generation

Distributed Storage

Microgrids

Solar

Demand Response

Energy Efficiency

Electric Vehicles

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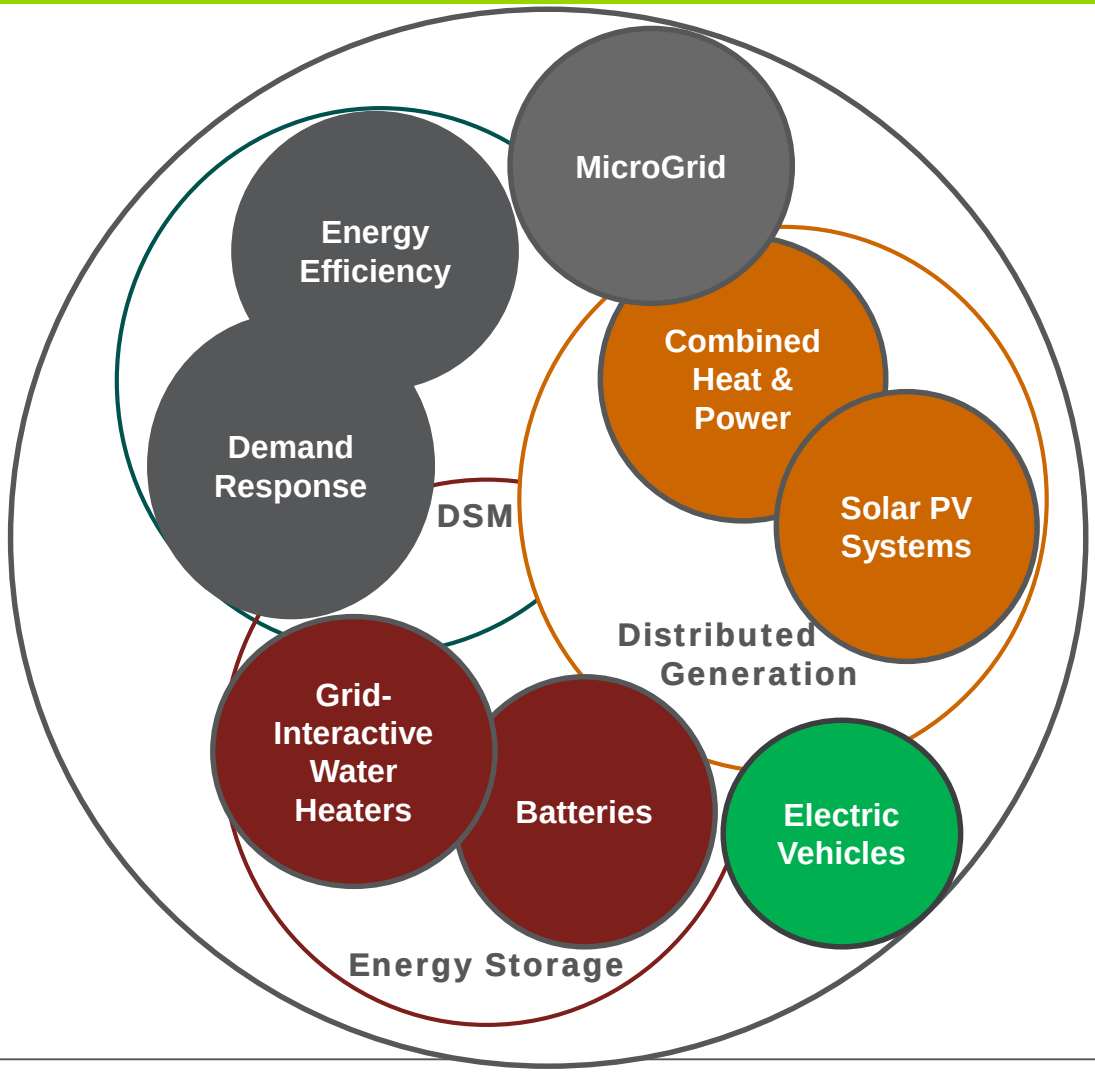
INTEGRATED DISTRIBUTED ENERGY RESOURCES (IDER)



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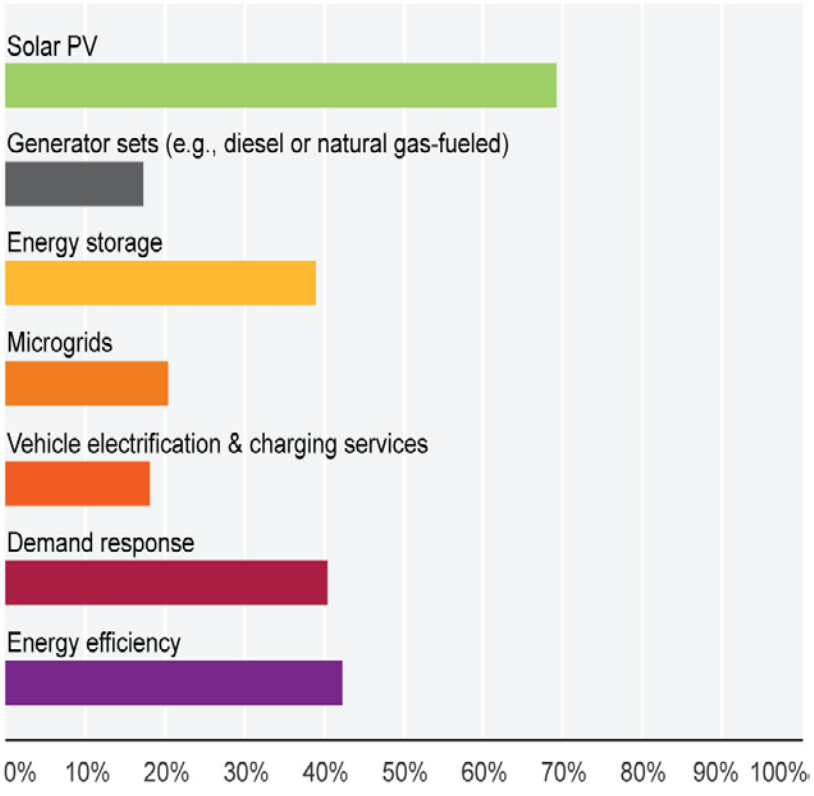
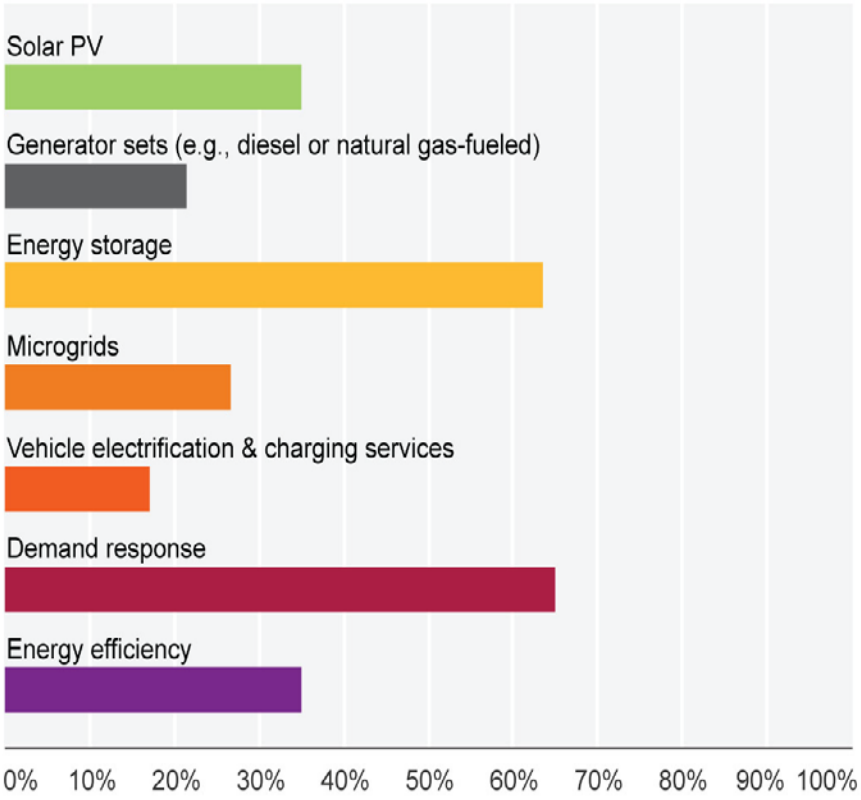
SOLAR IS POPULAR, BUT DR AND STORAGE ARE MORE USEFUL

Which will be the most **prevalent** DER **in terms of capacity** by 2025?



Which DER will be the **most useful to utility operations** by 2025?



Source: Navigant Consulting, Inc. Public Utilities Fortnightly. July 2017. State & Future of the Power Industry. https://www.Navigant.com/new/corporate-news/2017/state-and-future-of-power-industry-2

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EVOLVING C&I UTILITY CUSTOMER NEEDS

C&I customers (including Multi-Family) seek cost-effective, customized, and comprehensive energy solutions that can guarantee energy use reduction and savings without capital expenditures or impact to their day-to-day operations.

DELIVER COST REDUCTIONS	IMPROVE SUPPLY QUALITY	IMPROVE SUSTAINABILITY	DRIVE SCALABLE SOLUTIONS	SIMPLIFY OPERATIONS
C&I customers under pressure to reduce total energy expenditures with minimal capital expenditures (i.e. financing flexibility)	An increased focus on resiliency and redundancy of supply requires dependable solutions	An increased focus on sustainability and regulatory compliance (e.g. renewables, GHG) requires a comprehensive energy strategy	Large customers seek scalable enterprise-wide solutions to monitor, benchmark, and optimize energy costs	Corporate energy management functions have become complex and customers seek to simplify operations and refocus on core business

Emerging Trends for large C&I customers:

- Move to lower carbon energy and DER
  - Onsite distributed generation, solar PV
  - Demand response, energy storage, microgrids

Many evolutions are taking place in the current C&I energy services market on both the supply side and the demand side.

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DER SILOS: VENDORS, PLATFORMS, AND BUYERS

Distributed Generation

Distributed Storage

Microgrids

Solar

Demand Response

Energy Efficiency

Electric Vehicles

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DIFFERENT FINANCING MODELS

DER Finance Risk by Instrument Class

FINANCE INSTRUMENT CLASS	DESCRIPTION	RISK
Equipment Lease/Loans	Fixed payments for use or purchase of system, often with bundled O&M and performance guarantees	○
Power Purchase Agreement	Fixed service payments based only on actual kilowatt-hours of onsite energy supply provided	◐
Efficiency Savings Agreement	Fixed service payments based only on actual avoided kilowatt-hours of electricity or kilowatts of demand	◐
Shared Savings Agreement	Customer savings and DER deployment financed from savings	●
'As a Service' Subscription	A fixed subscription contract for the deployment of software, technology, and services	○

LEGEND

● ***High Risk*:** Requires complex pre-project analytics and M&V to manage savings performance risks	◐ ***Moderate Risk*:** Uses mature pre-project analytics and proven M&V to manage saving performance risks	○ ***Low Risk*:** Customer credit risk; no pre-project analytics or ongoing M&V required to manage savings risks

DER PROJECT TRANSACTION OPTIONS

New DER Solutions		Range of Transaction Options
Portfolio Advisory Services	• Strategic Guidance • Portfolio Benchmarking • DER technology feasibility, real-time EM&V • DER Financing models	• Fee for Service (upfront payment) • Bundled Financed Project Transaction
Energy Efficiency & Building Optimization	• Lighting • C&I ECM Retrofits • Industrial Energy Management • Building Optimization & Retrocommissioning	• Equipment Purchase (+/- O&M) • Energy Savings Performance Contract • Lighting as a Service Agreement • Energy Savings Agreement • Building Optimization as a Service
Offsite Energy Supply	• Retail choice procurement • Offsite LFGE procurement • Large offsite wind, solar procurement	• Retail choice procurement • Large offsite wind or solar PPA • LFGE procurement agreement
Onsite Energy Supply	• Onsite solar PV • Combined heat and power (CHP) • Onsite diesel & natural gas gensets • Microturbines, Fuel cells	• Equipment Purchase (+/- O&M) • Solar PPA • Solar + Storage PPA • Equipment Lease or Loan
Load Management & Optimization	• DR Capacity Market Participation • Energy storage, Microgrids, EV charging • Intelligent BEMs & BACs	• Equipment Purchase (+/- O&M) • DR Capacity Agreement • Equipment Lease or Loan • Energy Storage Demand Savings Agreement • Intelligent Buildings Energy Management as a Service

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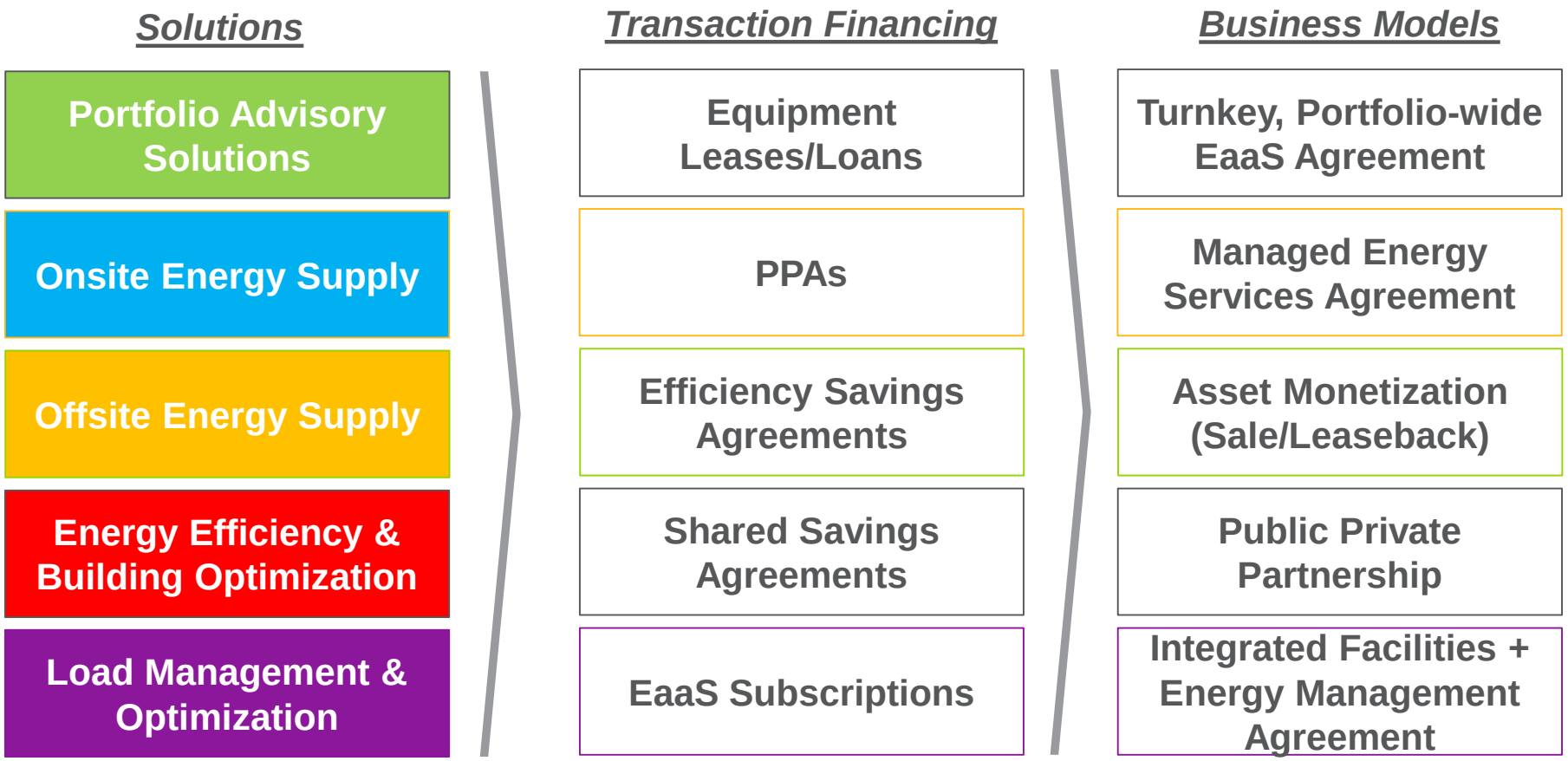
FLEXIBLE FINANCING OPTIONS CREATE BUSINESS MODEL VALUE

The deployment of these new portfolio-wide solutions across a broad set of financing transaction options to complement fee for service options enables new business models.



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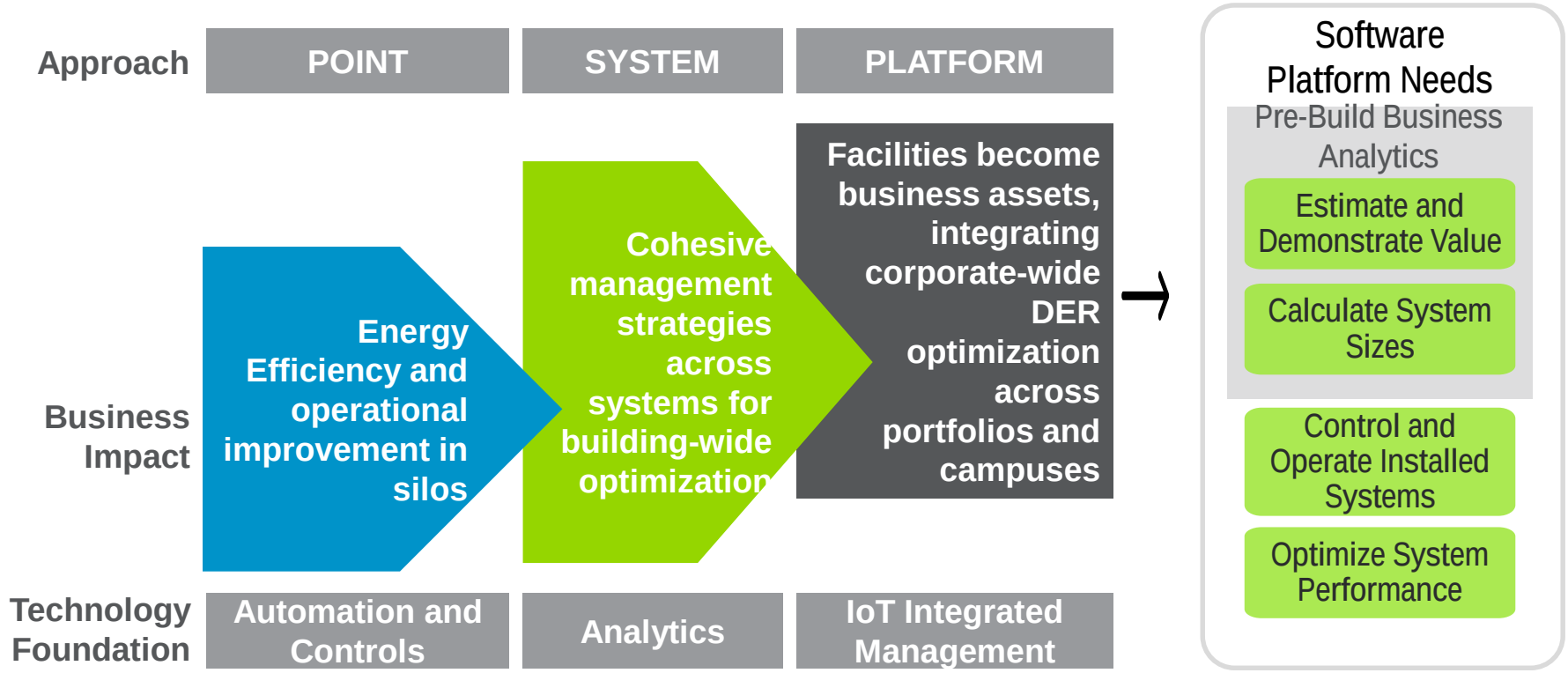
THE EVOLUTION OF SOFTWARE PLATFORM CAPABILITIES SUPPORTS INTEGRATED DER PROJECTS

Digital technologies have evolved from single points of control to intelligent platforms that allow optimization across buildings, campuses, and enterprise portfolios.



Integrated site-level software analytics are needed to deliver improved customer savings, lower cost M&V, and support DER project finance.

(Source: Navigant Research)

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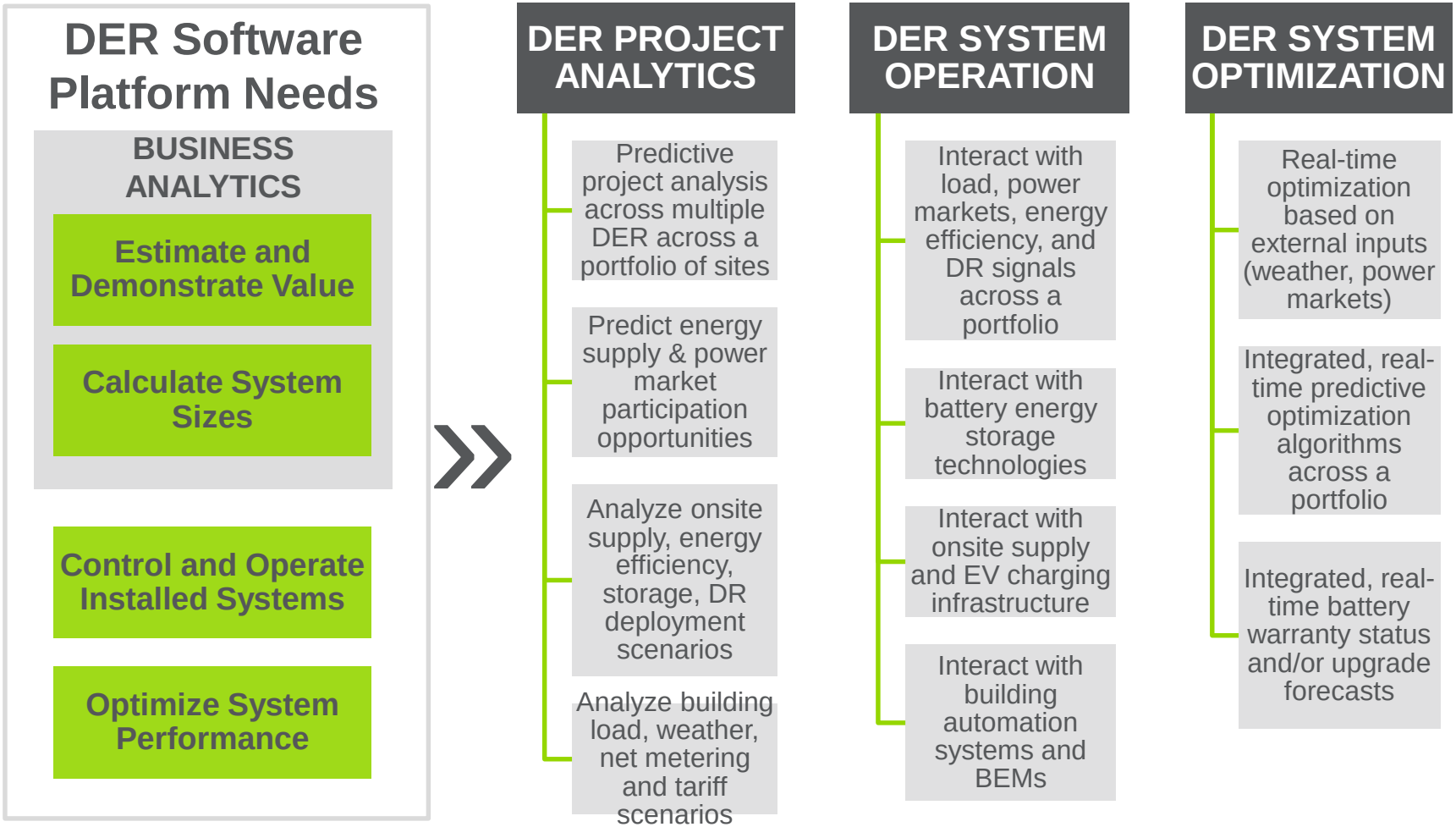
NEW SOFTWARE PLATFORM CAPABILITIES NEEDED TO SUPPORT INTEGRATED DER PROJECTS



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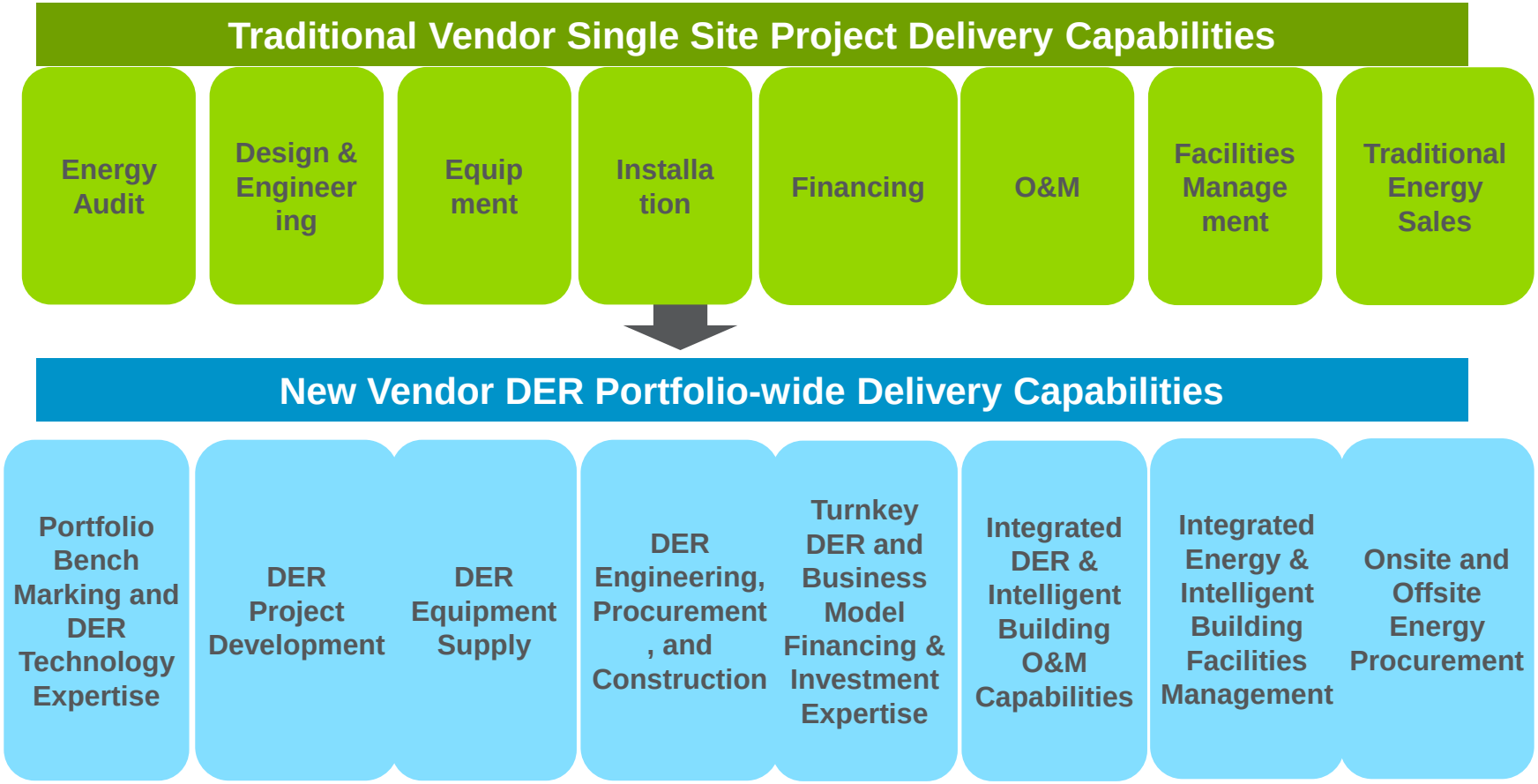
NEW BUSINESS MODELS WILL REQUIRE NEW VENDOR CAPABILITIES

Vendors will need to develop new in-house or partnership capabilities across the full spectrum of portfolio-wide solution delivery options.



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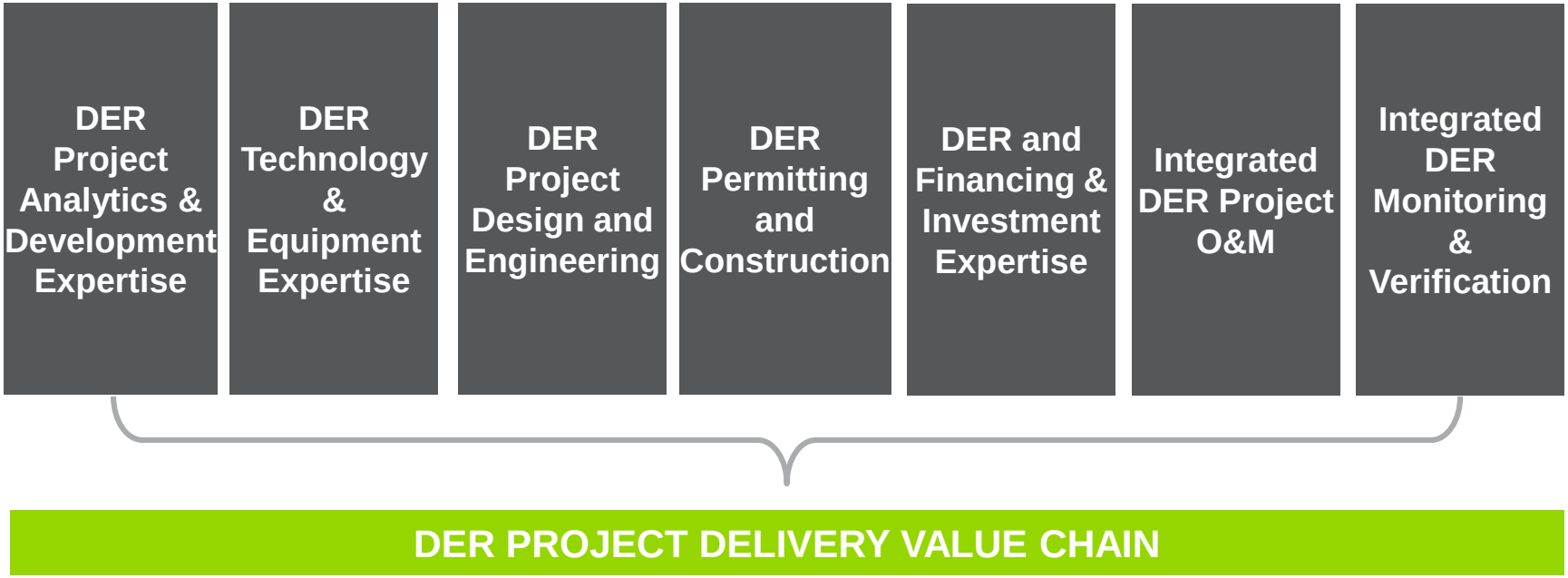
DER PROJECT DELIVERY VALUE CHAIN



Each step in the value chain is critical to the successful implementation of the project, and each step presents its own unique set of challenges and financial risks that DER financiers must assess and manage.

EVOLUTION OF DER BUSINESS MODELS

Business Model	PRODUCT-ORIENTED	SUBSCRIPTION-BASED	SOLUTIONS PROVIDER	NETWORK
Examples	HVAC Lighting	BEMS SaaS offerings	Software plus IoT, bundled services	Building-to-grid, integrated DER
Approach	Point	System	Platform	Ecosystem
Business Impact	Efficiency and operational improvements in silos	Cohesive management strategies for buildingwide optimization	Facilities become flexible business assets that meet core business challenges of specific customers	Two-way, leveraged value across and between the network platforms
Technology Foundation	Automation and controls	Analytics	Integrated management and services	Network communications
	Pre-2005	2005-2012	2012-2018+	

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A MOVE TOWARDS ORCHESTRATED DER CREATES VENDOR VALUE

Delivery of business model options can drive improved customer retention and improved margins due to long term, higher margin recurring revenue service contracts towards more digitalized platform solutions.

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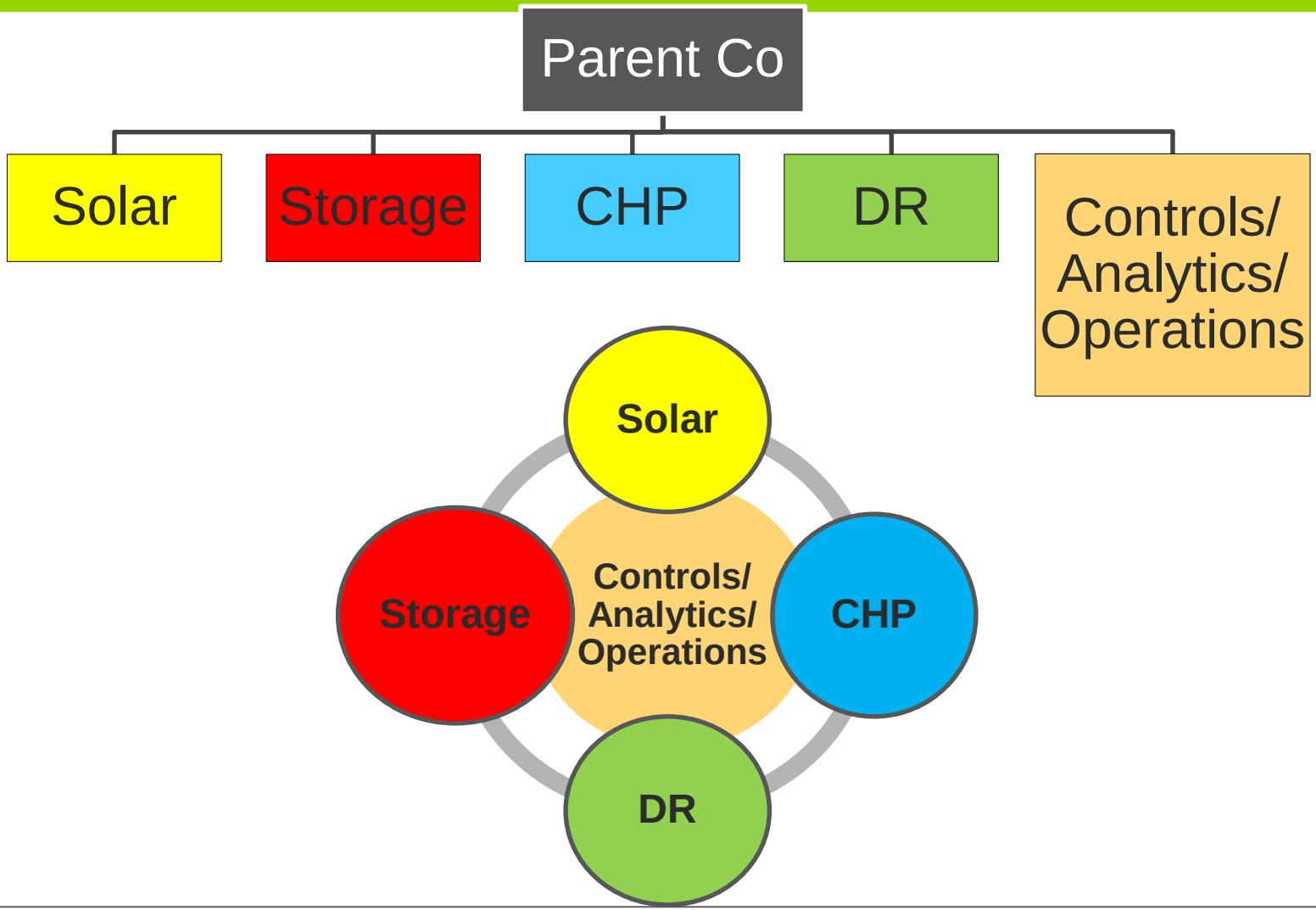
ACQUIRE OR PARTNER?



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