Singularity

AI For the Future of Distributed Energy

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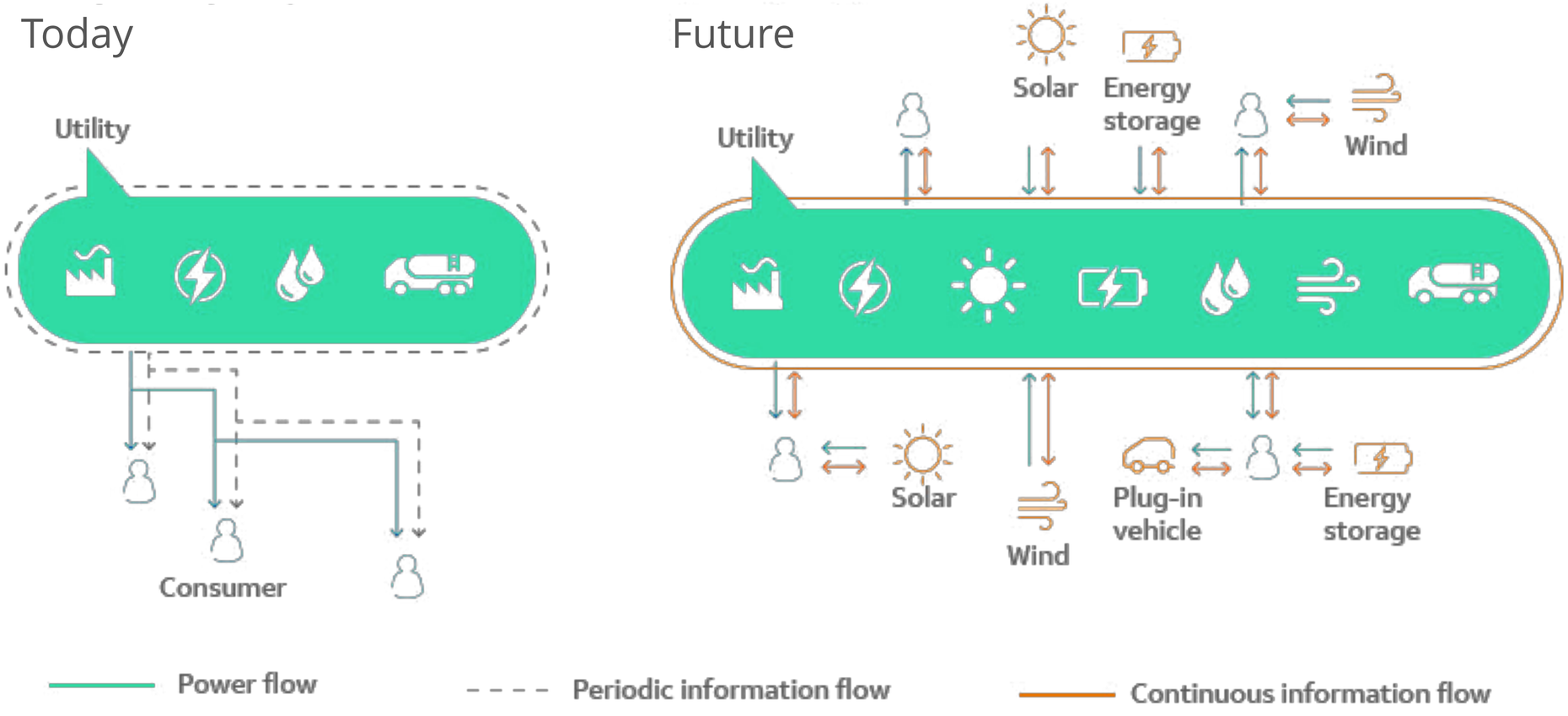
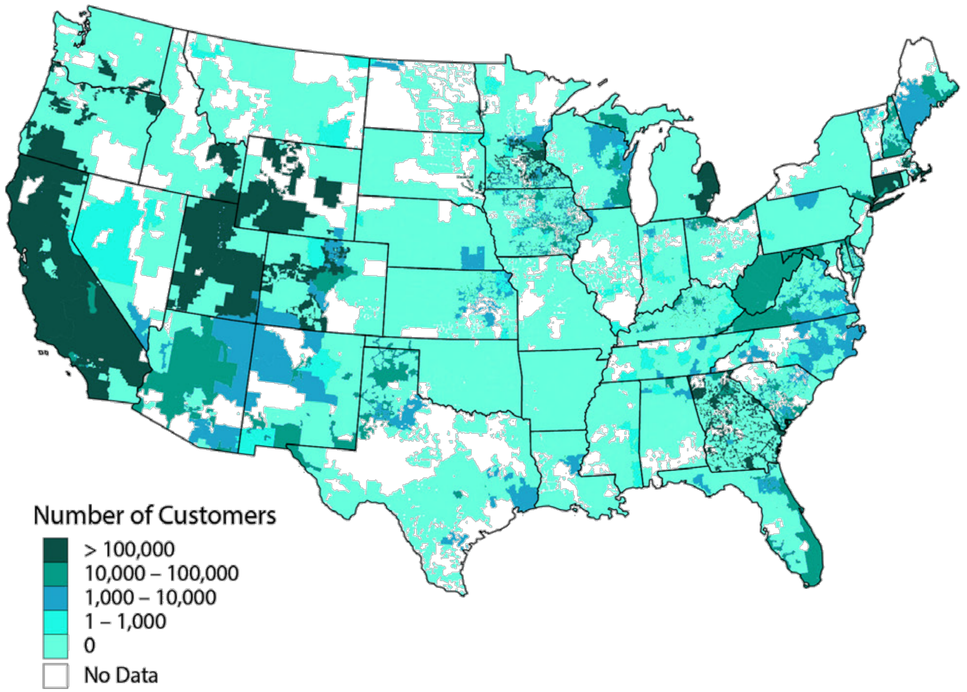
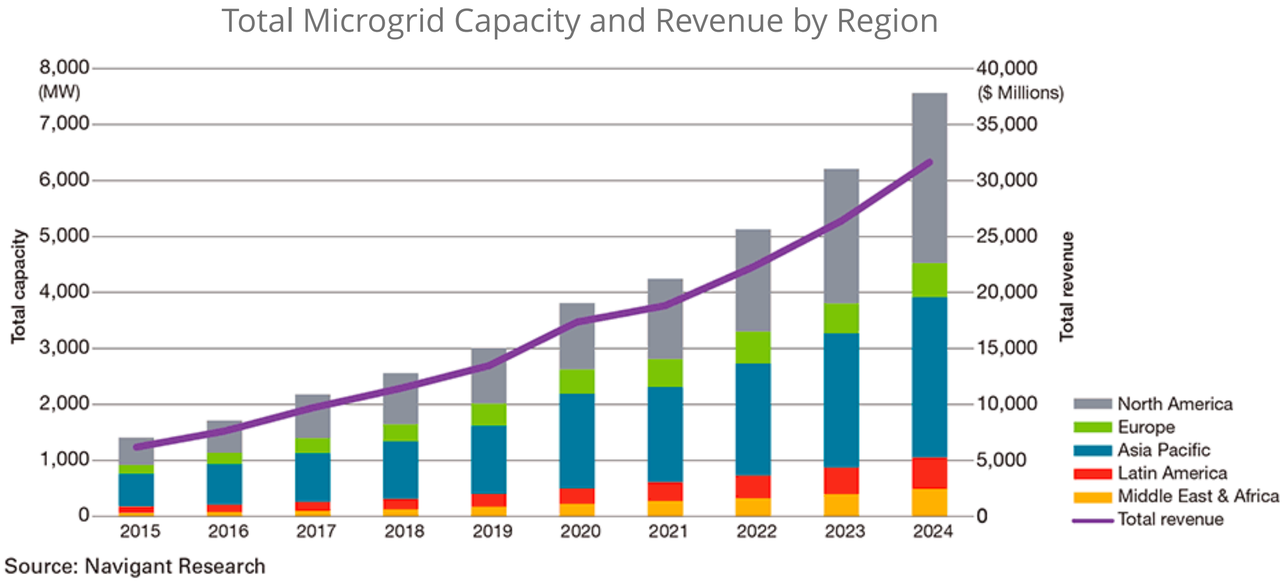
TRANSFORMING CENTRALIZED POWER GRIDS TOWARDS A DISTRIBUTED ENERGY FUTURE



WE ADDRESS A MASSIVE OPPORTUNITY





Source: Navigant Research

$12B

Total Addressable US Market

5M

Commercial & Industry (C&I) Customers

A Profound Transformation:

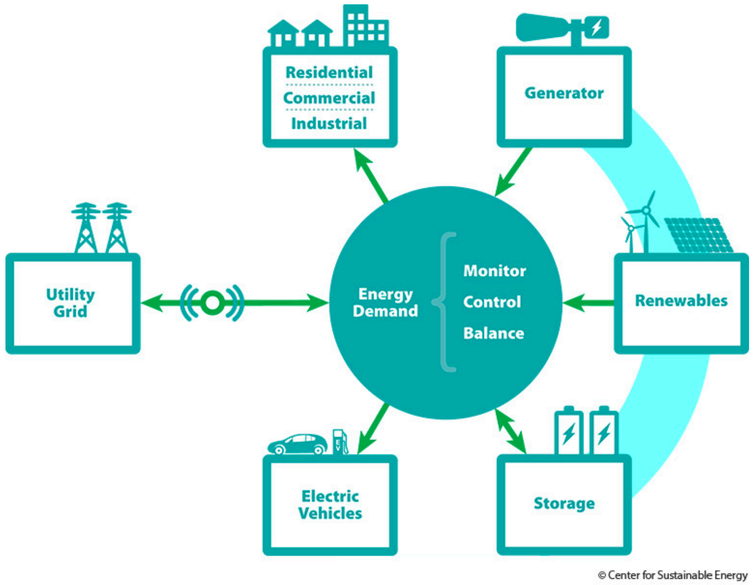
- Distributed generation/storage/EV rising
- Two-way power/information flows
- Autonomous microgrids emerging

Yet, we lack a holistic approach to manage this new distributed system to realize its full value

Source: "Identifying Potential Markets for Behind-the-Meter Battery Energy Storage: A Survey of US Demand Charges", NREAL, 2017

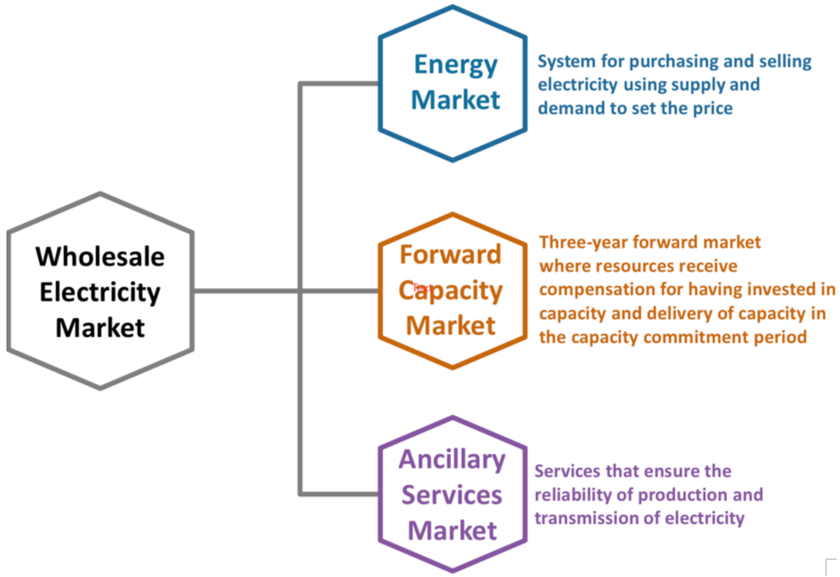
IMPLICATIONS FOR END USERS

A more complicated system



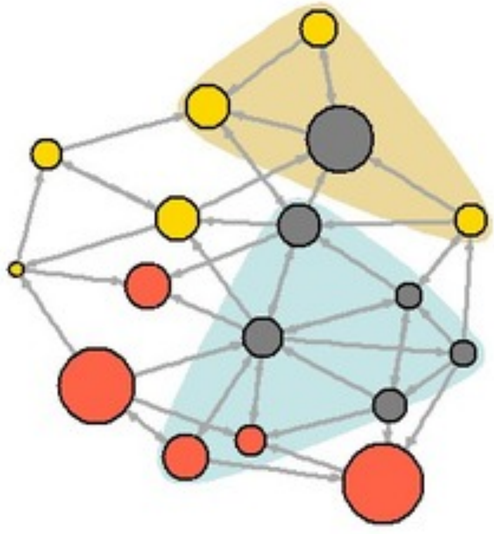
Requires active/advanced management

A more complex market



Requires deep understanding of the market

A more dynamic grid



Requires access to a connected network

CONFLICTING STAKEHOLDER OBJECTIVES

	CFO	**Sustainability Manager**	**Facility Manager**
Goals	• Minimize costs • Maximize ROI	• Reduce CO2 • Improve efficiency	• Minimize complaints • Streamline operations
Challenges	• Capturing all asset revenue streams is difficult	• Responding to price signals alone could increase CO2	• Flexibility often contradicts with reliability

Crucial to meet all these objectives

VALUE PROP

Singularity's solution addresses the objectives of all critical energy management stakeholders

ECONOMICS

- Save costs + generate revenues from new markets
- 10X more revenue

SUSTAINABILITY

- Active CO2 management using real-time data
- Quantifiable CO2 reductions without affecting $

RELIABILITY

- Algorithms with customer specific constraints/metrics
- Guarantee reliability/ satisfaction

JOINT OPTIMAL DER MANAGEMENT SOLUTION

PRICING (RETAIL, WHOLESALE)

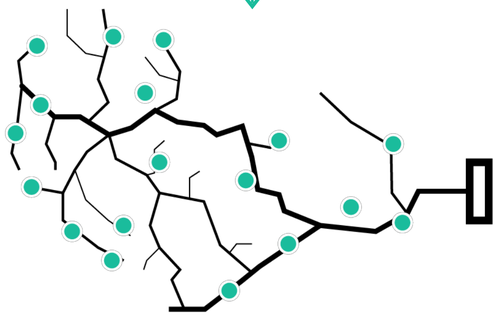
MARGINAL CARBON INTENSITY

USER INPUTS/ CONSTRAINTS

Singularity Platform

Real-Time Signals → **Algorithms** → Jointly Optimize

Sense, Control, and Feedback



PHYSICAL DER NETWORK

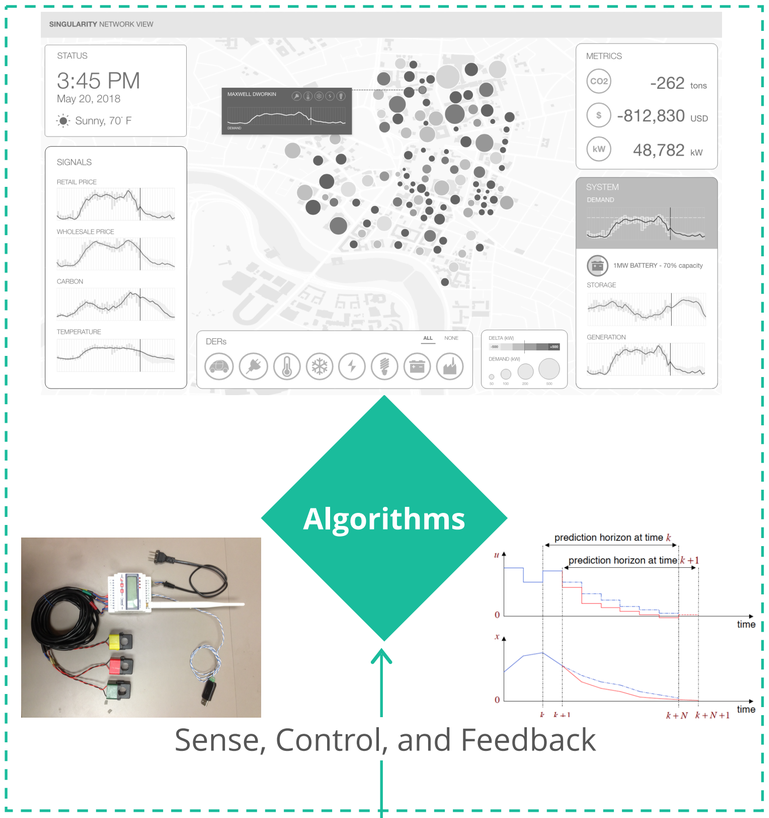
1+1>2

ECONOMICS

SUSTAINABILITY

RELIABILITY

HARDWARE-AGNOSTIC PLATFORM



Software Application

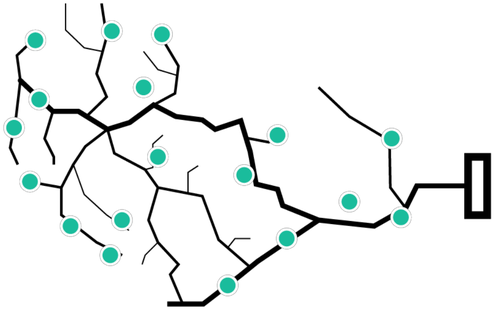
Network & Intelligence Layer

Asset Connectivity

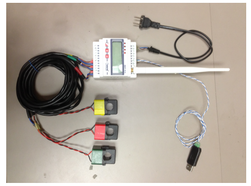
Physical DER Network

SINGULARITY PRODUCT OFFERING

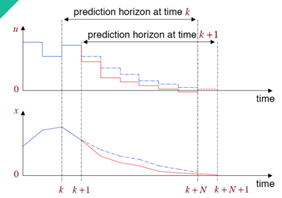
Asset Connectivity



Network & Intelligence Layer



Algorithms



Software Application

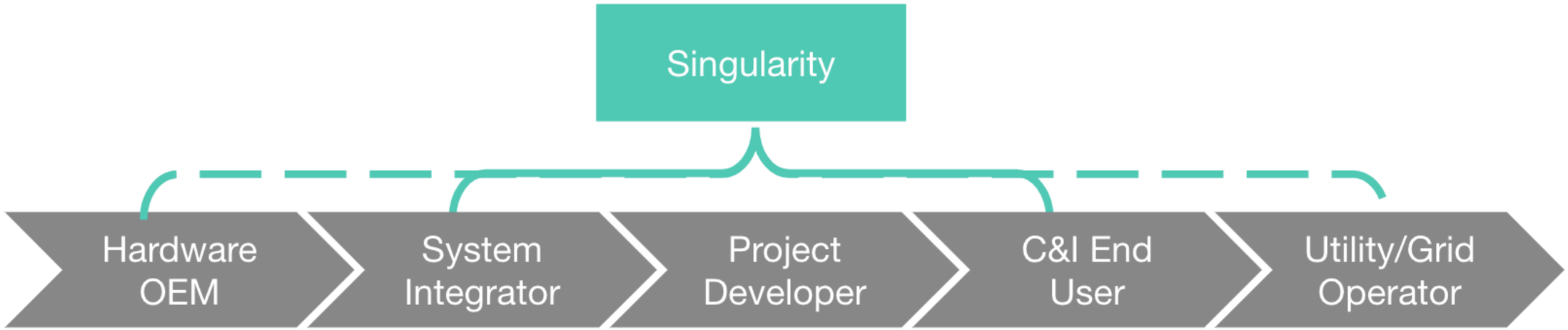
Solution

- Network implementation to **connect customer assets** to virtual DER network
- Ongoing access to network; programmed to **deliver value** based on customer defined business objectives
- Software application to **monitor and visualize** system results and savings

Pricing

- **One-time fee** to integrate assets into network
- **Recurring "shared savings" fees** for ongoing network access and cloud based software application

DER VALUE CHAIN: WHERE WE FIT



Hardware OEM	System Integrator	Project Developer	C&I End User	Utility/Grid Operator
Integrate software so OEMs components come with embedded network access	Integrate software so system integrators' turnkey systems come with embedded network access	Offer software and network access to developers to provide a differentiated, full stack solution	Integrate existing (or planned) end user assets with our network	Enable direct participation in our network, rather than simply being a passive market signal

GO-TO-MARKET APPROACH

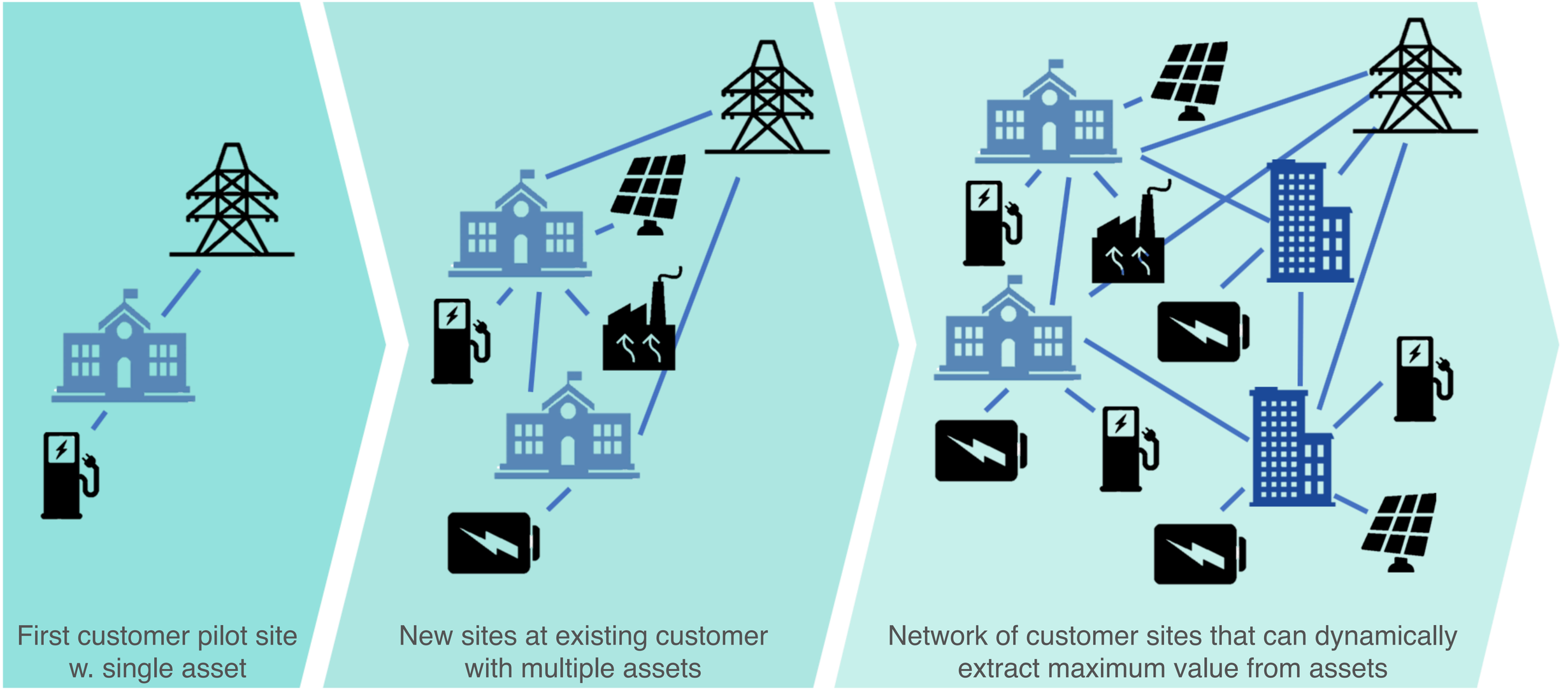
Direct to End Users

- **Institutional customers** targeted as beachhead market because **carbon reduction value prop resonates most clearly** with this market segment
- Approach will be used to generate **product proof points and get market validation**
- Enables **initial network development and value extraction**

Channel Partners

- Approach will be used to increase market penetration **through partner's existing customer base** and GTM apparatus
- Allows Singularity to **focus on core competency of software and intelligence development** and keep operations lean
- **Enables networks to scale** and support maximum value extraction

“LAND AND EXPAND” STRATEGY TO BUILD NETWORKS

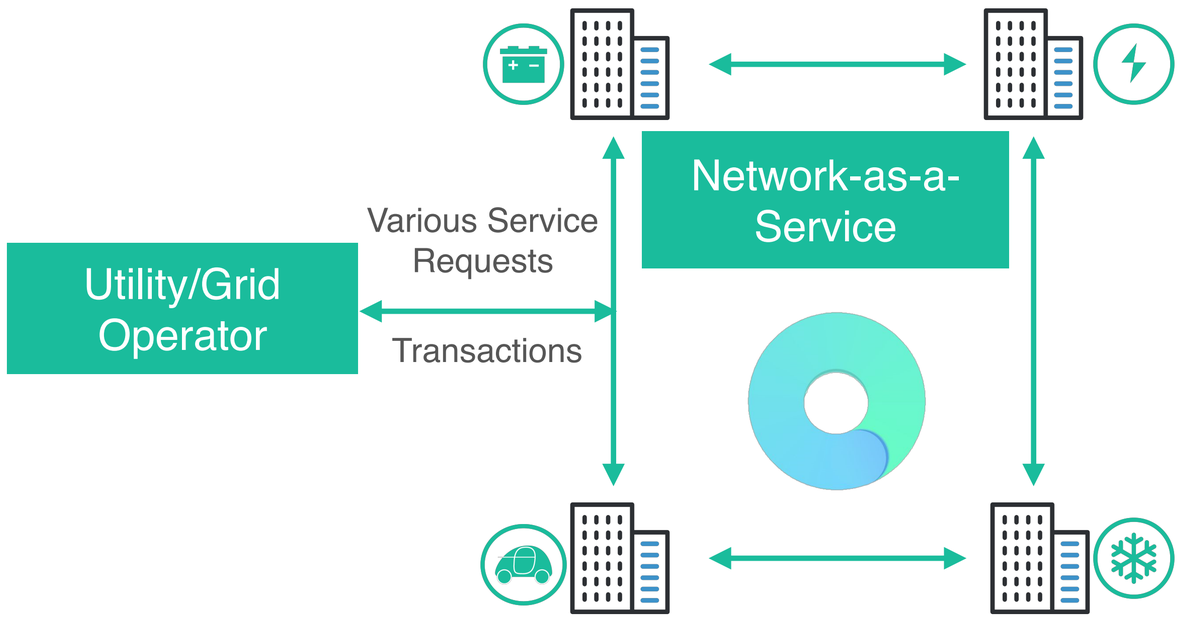


First customer pilot site w. single asset

New sites at existing customer with multiple assets

Network of customer sites that can dynamically extract maximum value from assets

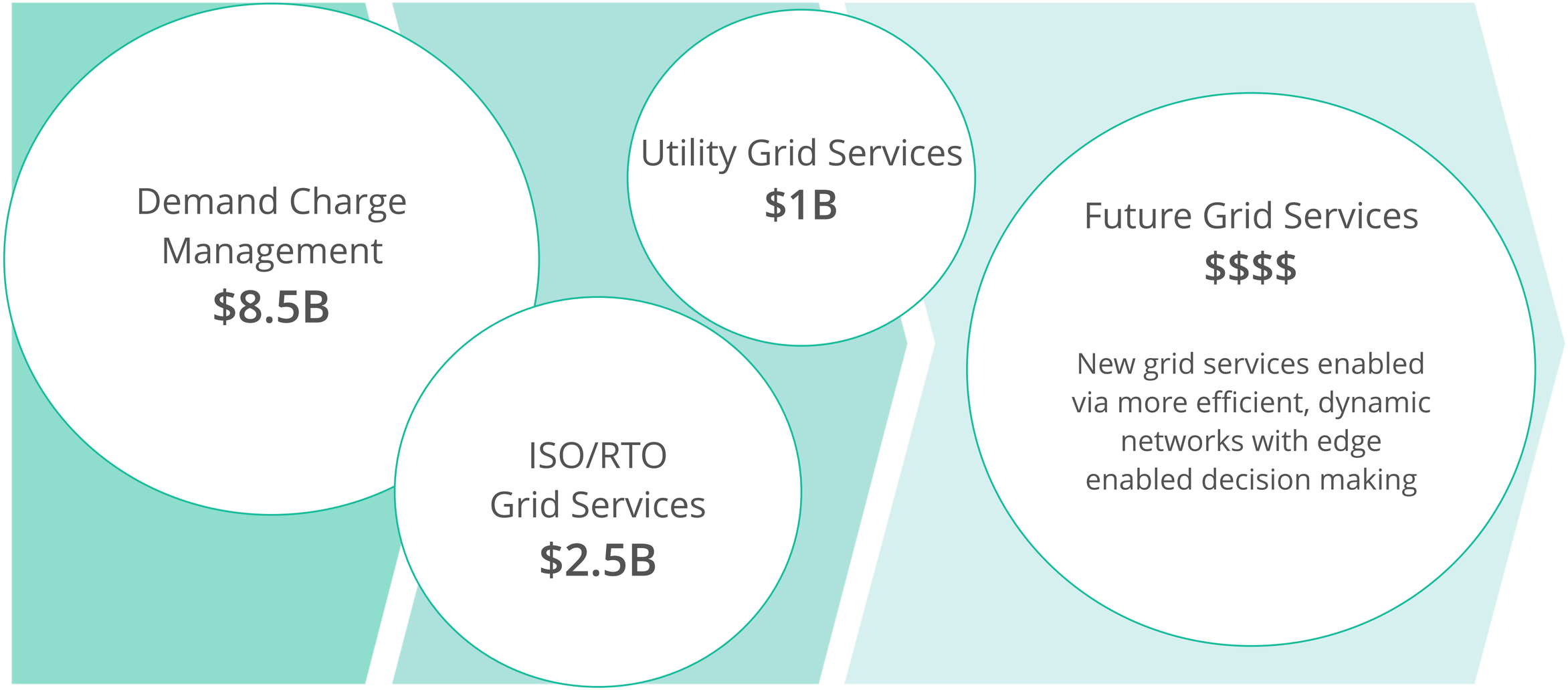
REALIZING THE NETWORK'S FULL VALUE



- Efficient: two-way supply-demand balancing
- Decentralized: provide controllability while protecting customer data privacy/autonomy
- Customer engagement: transparent mechanisms to incentive and engage customers

MARKET OPPORTUNITY

Today's Total US Addressable Market = **$12B**



MARKET TRACTION

Direct to End Users

- In process of acquiring **first paying customer** via battery storage pilot with HBS
- In conversations with other Harvard schools about additional campus opportunities, in line with our expected “land and expand” go-to-market strategy
- Harvard Office for Sustainability has made introductions to other Boston based institutions (i.e. Northeastern, BU, Tufts, MIT)

Channel Partners

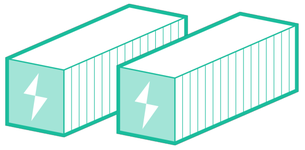
- Negotiating an MOU for broader **Schneider Electric partnership**
- Schneider has approached us with **a >1MW microgrid partnership opportunity**
- In conversations with other system integrators and developers that have institutional and commercial customers

CASE STUDY: HARVARD MICROGRID

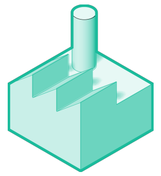
Singularity Platform

AI

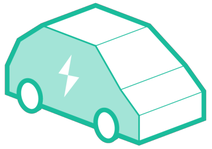
Sense, Control, and Feedback



2MW / 2 MWh
Energy storage



1 MW
Distributed generation



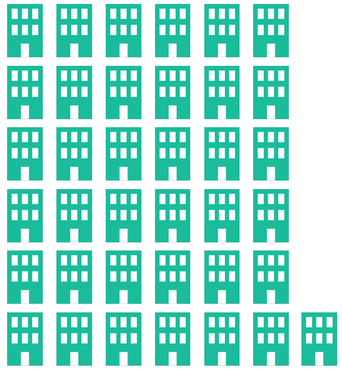
200 EVs
Level 2 charging

$ **-$583,000/yr**

CO_2 **-63.28MT/yr**

Sequestration of 745 acres of forest per year[1]
~ twice the size of Harvard Central Campus

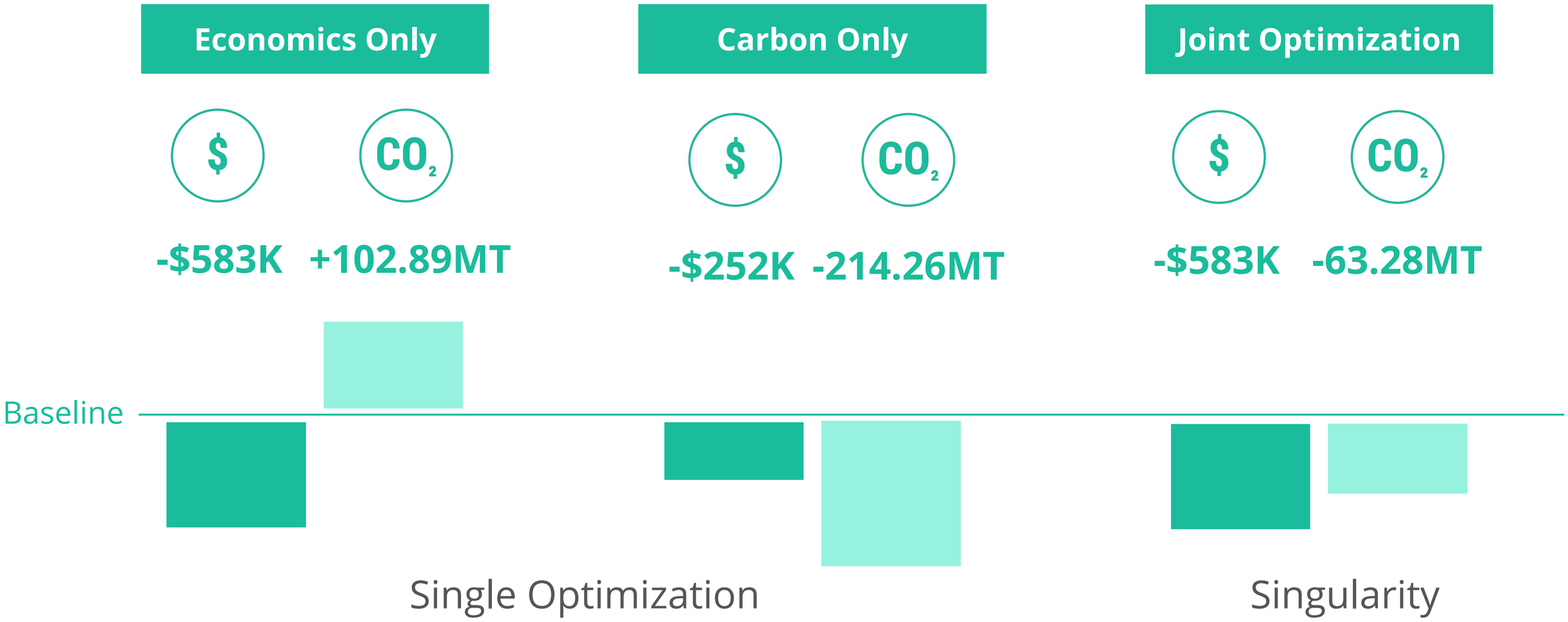
37 buildings
for up to **4 hrs**



1. *https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator*

CARBON REDUCTION WITHOUT AFFECTING ECONOMICS

Because of our unique algorithmic approach, we are able to help Harvard meet its dual objectives of cost savings and carbon reduction.



TEAM WITH BALANCED TECH/BIZ BACKGROUNDS

Wenbo Shi

Chief Executive Officer

Harvard Postdoc

DOE smart grid demonstration project, most popular PhD thesis & IEEE papers

Nick Chen

Chief Operating Officer

Successful Entrepreneur

Expert in PM and BD, co-founded/invested in smart hardware/software startups

Maria Woodman

Chief Commercial Officer

HBS MBA

Extensive marketing, BD, corporate dev experience in DER space

Na Li

Chief Science Officer

Harvard EE Professor

Expert in optimization and control of distributed network systems and power systems

HARVARD
SCHOOL OF ENGINEERING AND APPLIED SCIENCES

HARVARD
BUSINESS SCHOOL

ENERNOC

THANK YOU!

- Addressing a 5M-customer, $12B market, transforming power grids towards a distributed energy future.

- Hardware-agnostic platform, unique technology to address all stakeholders' objectives, novel network solution to realize full value.

- Piloting at Harvard with the goal to expand to other large customers and partner with key players in the value chain.