

ARPA-E Technology-to-Market Overview

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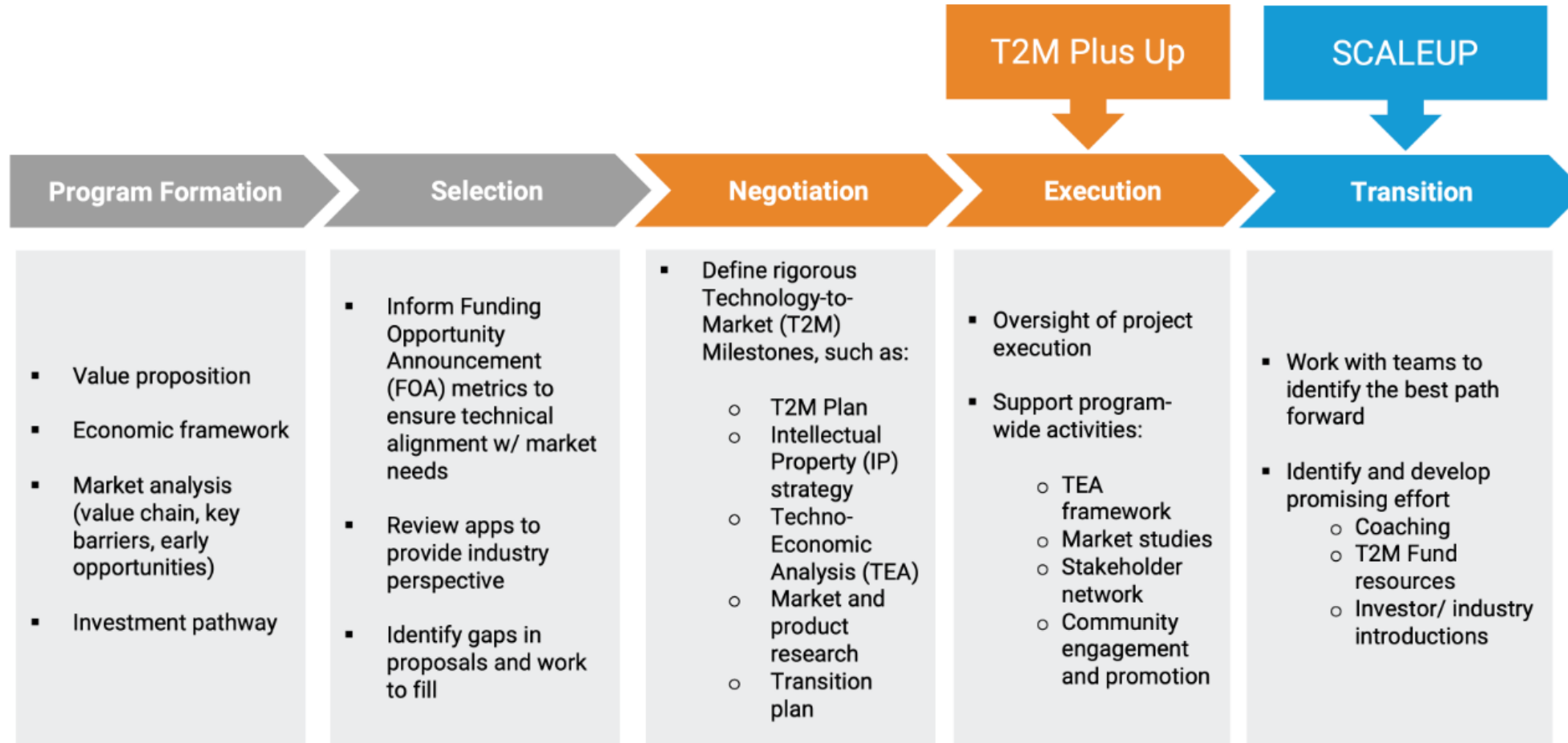
October 19, 2023

ARPA-E Motivation

If it works...

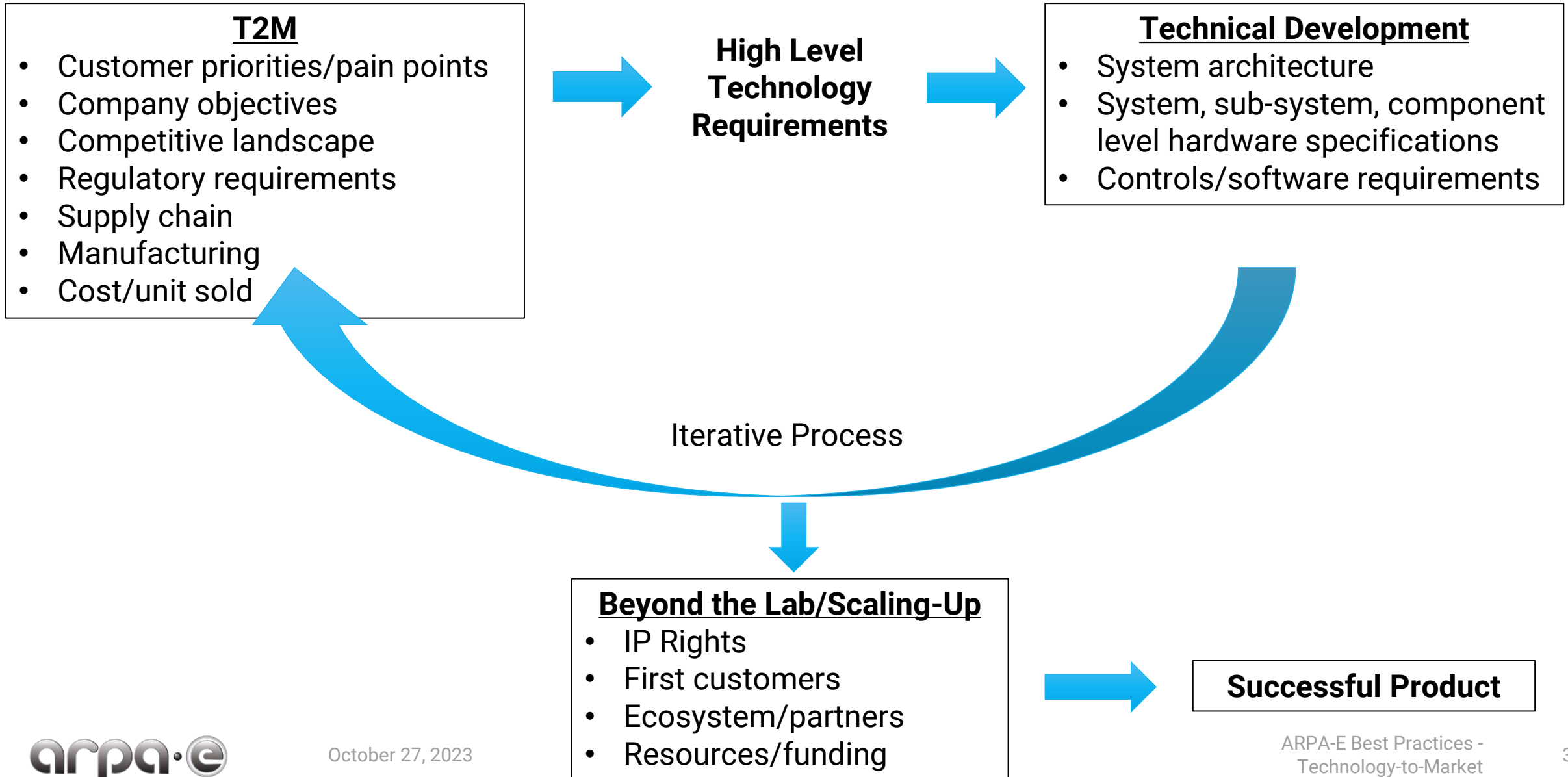
will it matter?

Tech-to-Market in the Project Lifecycle




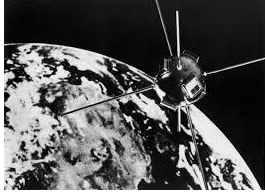


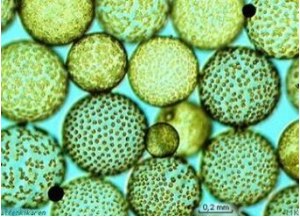





Highlights contributions of the T2M team through the lifecycle of a typical ARPA-E project

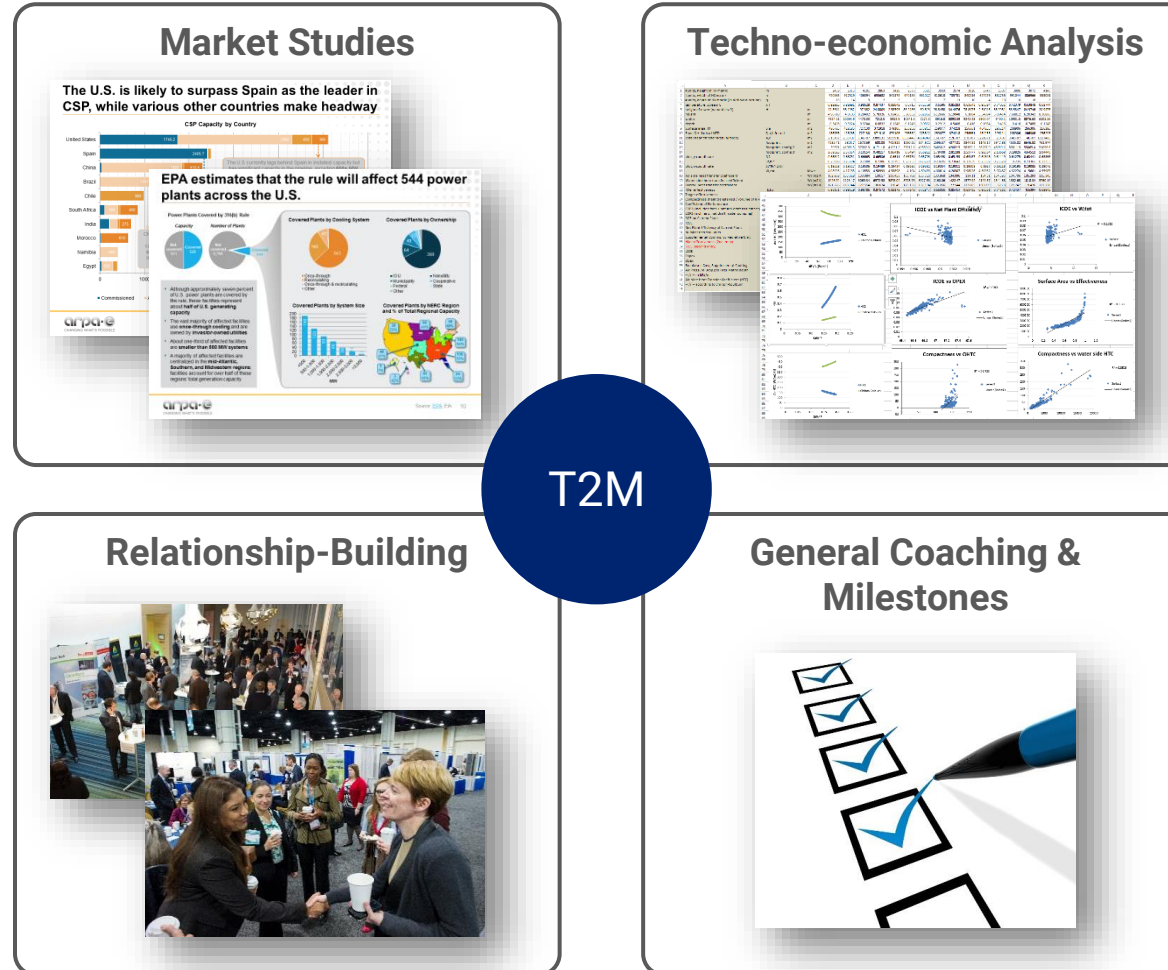
T2M and Technical Development are Coupled



Realizing the Full Potential of Technology is a Process

	Technology	First market	Intermediate Markets	Market disrupted
Li-Ion Batteries		 Long lived, energy dense cells	 Long lived, energy dense, rechargeable	 Long lived, energy dense, rechargeable, cost-effective
Photovoltaics			 <i>Decreasing cost</i> →	
Algae Fuels		 Nutrition supplements, pharmaceuticals		Commodity fuels? 

Major Responsibilities of Tech-to-Market Team



Project Team Responsibility – Assign a Qualified T2M Lead

- ▶ A single member of the project team **with the appropriate skills (training or experience in entrepreneurship, business and/or technology licensing)**
- ▶ Responsible for coordinating and leading T2M activities for the project, including completion and execution of the final version of the T2M Plan
- ▶ T2M Lead should be an **integral team member** with intimate knowledge of the project technology and should participate in all project reviews.

Elements of the Plan

A T2M plan is developed and submitted to ARPA-E for approval. The initial plan contains timing of the following key elements:

Demand/Market Assessment: Plan for market research, identification of pain points, potential entry markets/applications and outreach to a minimum of six potential customers including automotive OEMs, niche market end users, and battery makers.

Supply Chain Analysis: Producers of key materials/components identified along with volumes/specifications currently available in the market vs. long term needs of the technology.

Manufacturing & Scalability Analysis: Expected production process and production metrics around yield, purity, throughput, bottlenecks, etc. described. Risks in processes and supplies identified as manufacturing is scaled-up. Gaps in projected demand and ability to meet demand identified.

Cost/Techno-Economic Analysis: A model providing insights into trade-offs between product design, cost (including bill of materials), and performance attributes developed. Sensitivity analysis conducted to identify key contributors to overall system cost.

Regulatory Analysis: Regulatory landscape impacting product adoption analyzed.

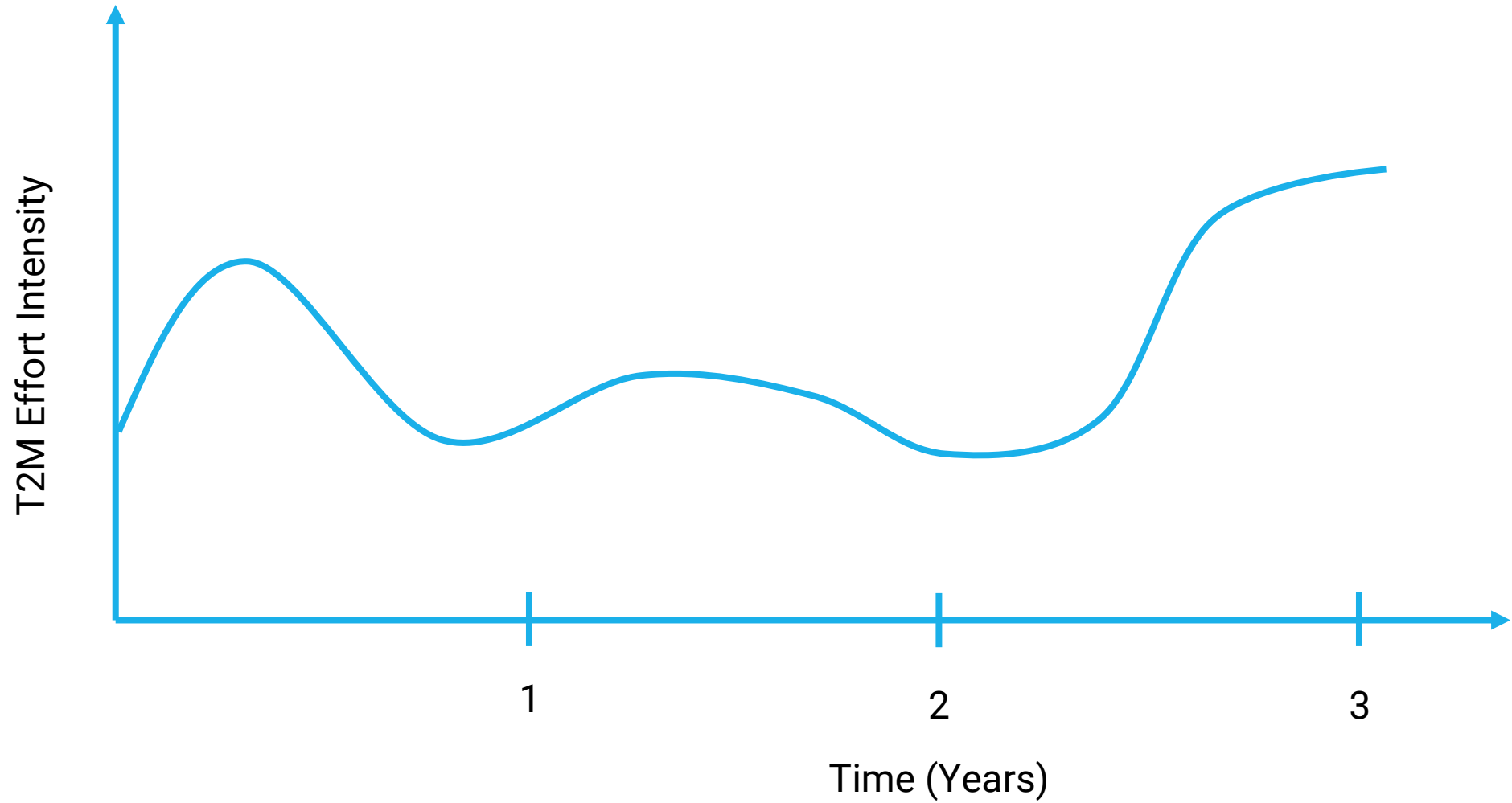
Competitive Analysis: Competitive products/approaches identified and their attributes (i.e. cost, performance, market share) compiled. Gap analysis conducted.

IP Strategy Developed: Invention disclosures and patent applications documented, required notifications filed to ARPA-E and registered in iEdison on an on-going basis.

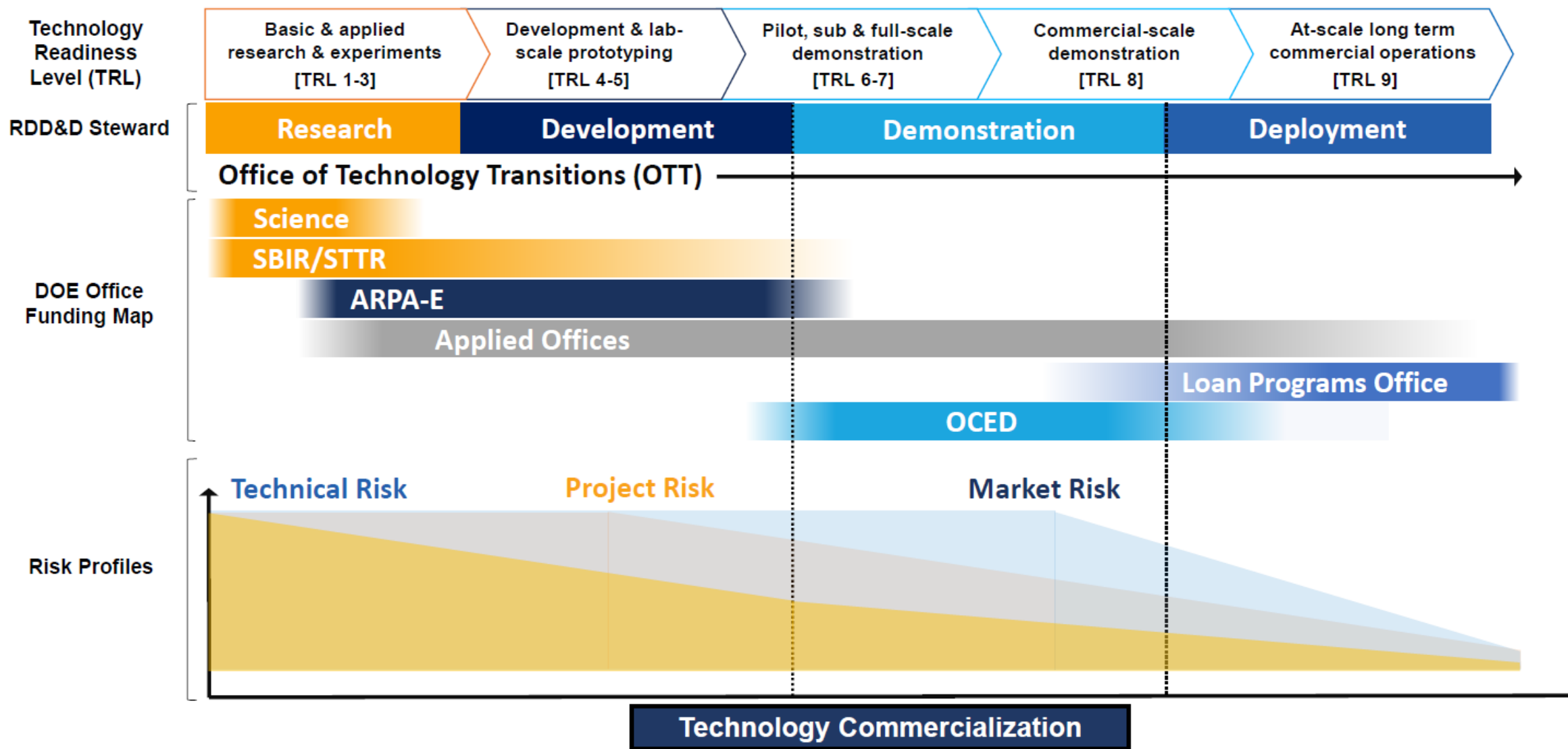
Ecosystem Evaluation: Describe what is needed to compete profitably in the EVs4ALL market (expected first customers, suppliers, partners, etc.) described.

Identify Needed Resources: Describe what is needed to bring the product to the EVs4ALL market (capital, facilities, team, etc.) described.

T2M Intensity Timeline



Role Across Research, Development, Demonstration & Deployment (RDD&D) Continuum

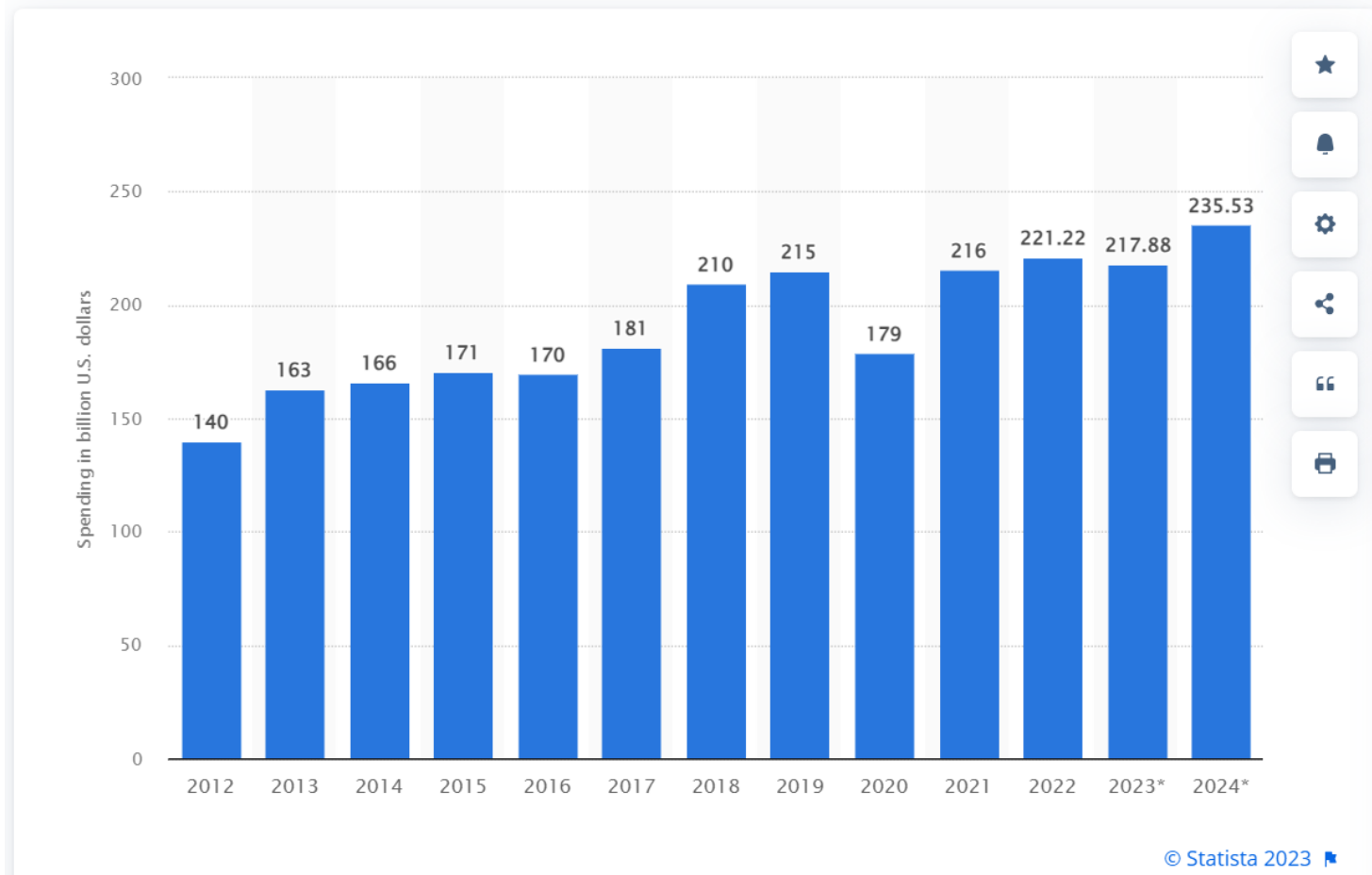


In Conclusion....

- ▶ Think of ARPA-E as **partners** in your commercialization efforts
 - Your success is our success
 - Reach out as soon as you notice a roadblock – we're here to help
- ▶ The first six months are **critical** in building the foundation of your commercialization efforts
- ▶ Don't waste any time in reaching out to potential customers
 - Focus on understanding their challenges
 - Don't worry about selling a product just yet
- ▶ **And remember.... A plan means nothing without execution!!**

How are Datacenter Markets Doing?

Information technology (IT) spending on data center systems
(in billion U.S. dollars)



- ▶ Robust growth continues, generative AI accelerant
- ▶ Head winds in terms of access to power and cooling

AI / MACHINE LEARNING

Reports: "Tsunami" of AI Demand Drives Record Data Center Leasing

Reports from research firm datacenterHawk and investment firm TD Cowen found data center leasing at record levels, as cloud providers look to secure capacity for AI workloads.

Rich Miller

July 27, 2023

The data center industry's dramatic expansion in Northern Virginia continues – but is hitting snags as its massive demand for electricity strains the region's power grid and space for the largest complexes begins to run out, according to a new report from real estate firm JLL.

FORBES > INNOVATION

AI, Liquid Cooling And The Data Center Of The Future



Holland Barry Forbes Councils Member
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ARPA-E Motivation

If it works...

will it matter?

Business Model Hypothesis

