Public-Private R&D Partnerships Examples

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DOE Hydrogen Program

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Public/Private R&D Partnerships

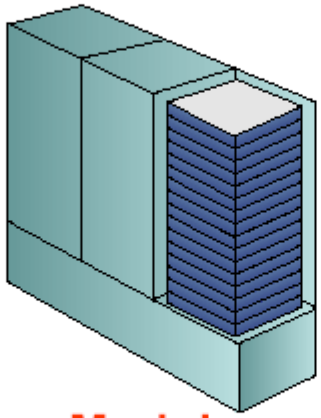
- DoD ManTech
- SemaTech
- Solid State Energy Conversion Alliance (SECA)
- FreedomCAR and Fuel Partnership
- Photovoltaic (PV) Manufacturing

A High Power Density, Low Cost Core Module for Multiple Applications

SECA

Stationary

Transportation



Core Module

Key to Cost Reduction:
Mass Customization of Common Modules

Military

SECA: Making Fuels Cells a Reality

2005

- **1st Generation Prototypes**
  - Testing & Evaluation

2010

- **$400/kW Modules**
  - Residential, Commercial, Industrial CHP
  - Transportation APUs

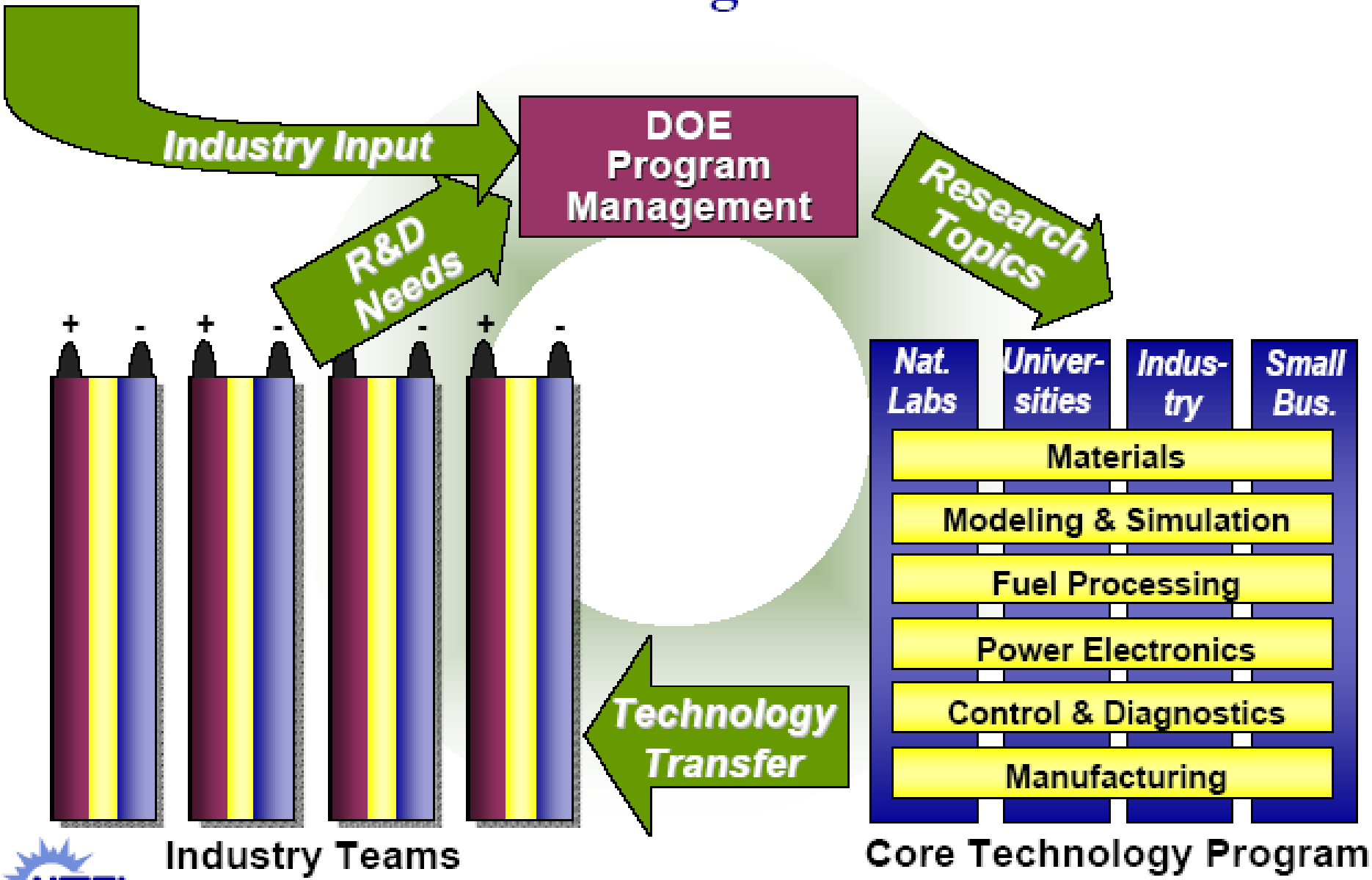
2011 - 2015

- **SECA fuel cells available for FutureGen**

2020

- **MW-Scale SECA fuel cells for Advanced Coal Power Plants**

SECA Program Structure



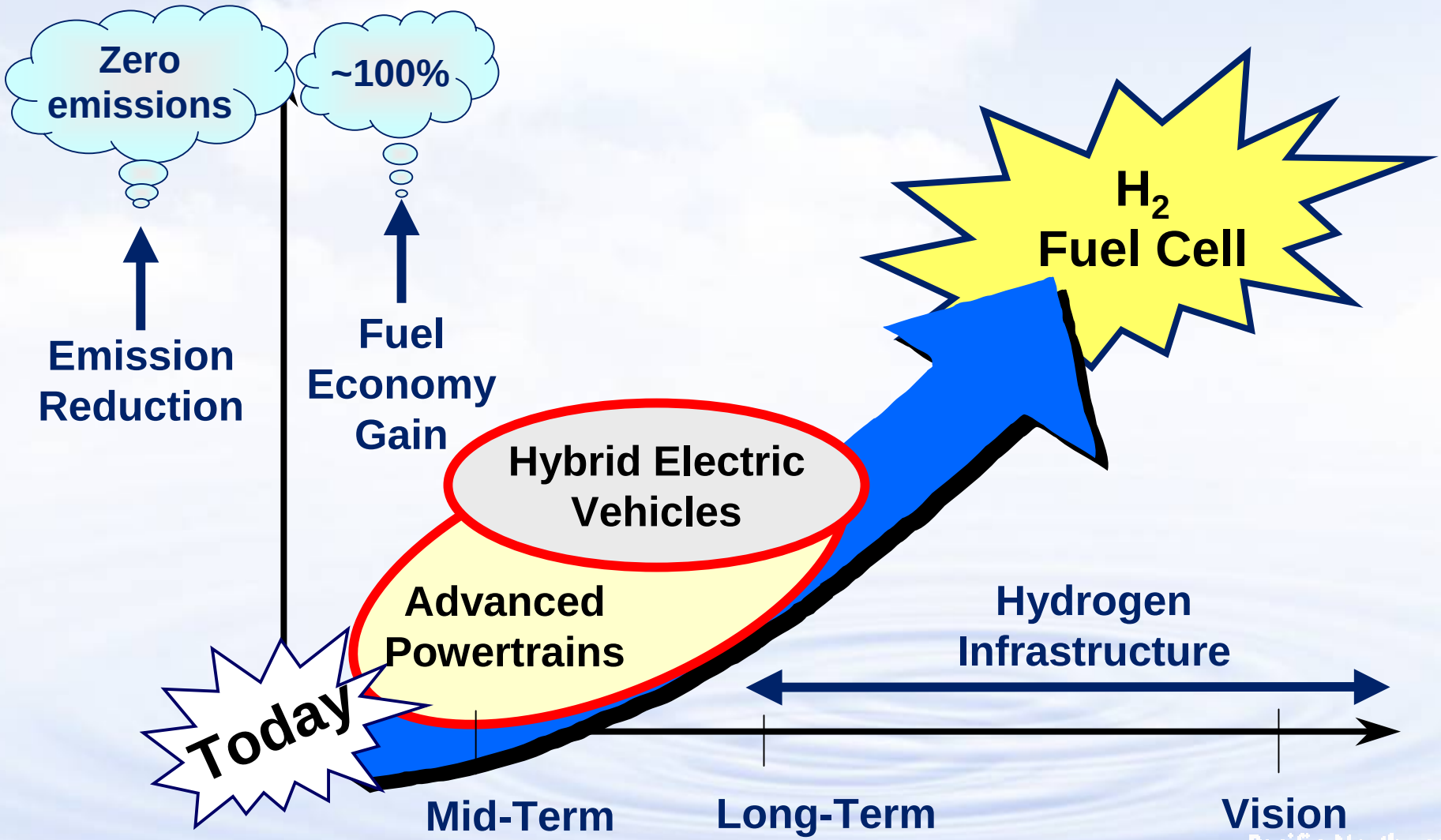
SECA Roles

- **Industry Teams**
  - Competitively selected to develop SOFC technology concept
  - Have ready access to markets
  - Coordinate with manufacturing projects
  - Supply input to shape Core Technology Program
- **Core Technology Program**
  - Provides problem-solving R&D
  - Consists of universities, R&D Companies, and National Laboratories
- **Federal Government**
  - Encourages broad national perspective to SOFC technology development beyond company-specific interests
  - Integrates and manages Industry Team projects with Core Technology Program

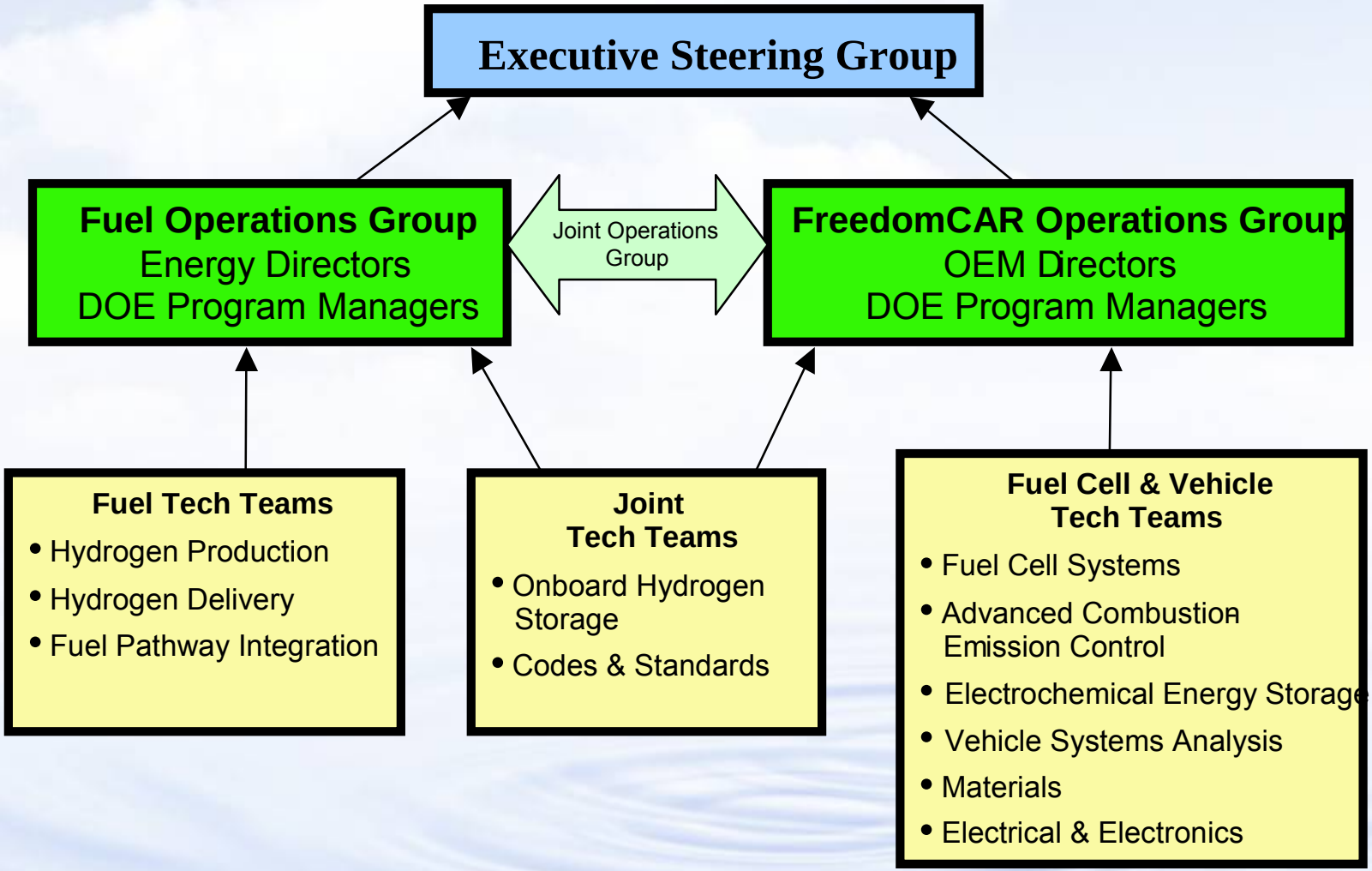
Intellectual Property
Cornerstone of the SEC Alliance

- **Exceptional circumstance under Bayh-Dole Act**
  - Industry has access to non-exclusive license on technology developed under Core Technology Program

FreedomCAR & Fuel Partnership Technology Vision



FreedomCAR and Fuel Partnership Organization



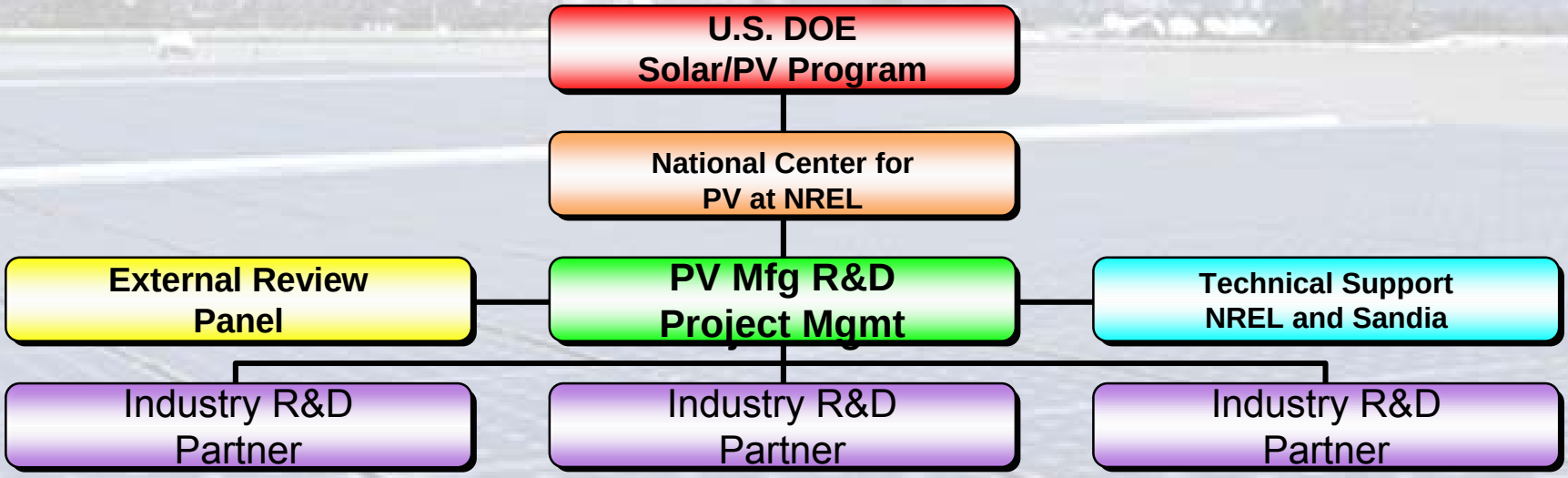
FreedomCAR and Fuel Partnership Technical Teams

- The technical teams consist of technology-specific experts from the USCAR and energy member companies and national laboratories as well as DOE technology development managers.
  - Additional expertise from other sources may be added as needed.

- Each technical team is responsible for developing R&D plans and roadmaps, reviewing research results, and evaluating the technical progress of the Partnership toward meeting the established research goals in their respective technical areas.

- Tech Teams typically meet at least 1 time per month
  - Frequency depends on need
  - Some Tech Teams meet bi-weekly, others quarterly

Structure of Photovoltaic Manufacturing R&D Program



- Started 1990
- $140 M to-date
  - $80 M DOE
  - $60 M Industry
- 6 competitive procurements - 3 year projects
- Projects developed processes for mfg of cells and modules, and mfg equipment
- Lower product prices
  - DOE $ recaptured in 1998; 366% ROI
  - Industry $ recaptured in 1999; 319% ROI
- PV mfg costs have decrease56% ($5.47/Wp to $2.42/Wp)

Summary

DOE will draw from its experience with other public-private partnerships to structure the program on Manufacturing R&D for the Hydrogen Economy.