



U.S. DEPARTMENT OF
ENERGY

Perspectives on DOE Policies and Priorities | IRED2022

Russ Conklin, Senior International Relations Specialist
Office of Multilateral Climate and Clean Energy Engagement

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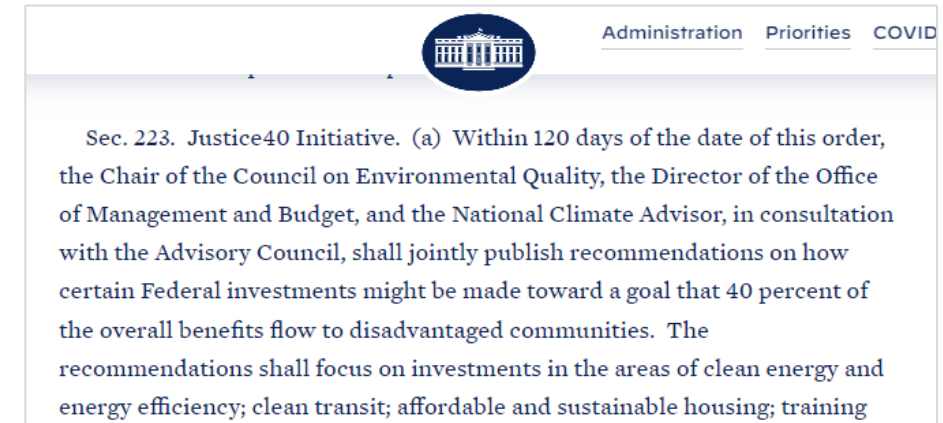
Goals

- Reduce U.S. GHG pollution by 50-52% by 2030 from 2005 levels
- Carbon-pollution free power sector by 2035
- Net zero emissions economy by 2050

- **Justice40**

- **Energy Earthshots**

- *And more...*



Leadership

...The global market for clean energy technologies is projected to reach \$23 trillion by the end of this decade—at a minimum. This market could be the most powerful engine for economic growth that the world has ever seen.

And we can use it to ensure that the clean energy transition is an equitable transition... An equitable transition that expands opportunity—not just through new jobs and economic growth, but through greater access to reliable, affordable, resilient power, from our biggest cities to our smallest and most remote towns.

We know that this won't happen on its own. It requires an intentional effort, with tailored policies...

...If we want to build a clean economy that avoids the vulnerabilities we see today, as Putin weaponizes gas in Europe today, we have to work together.

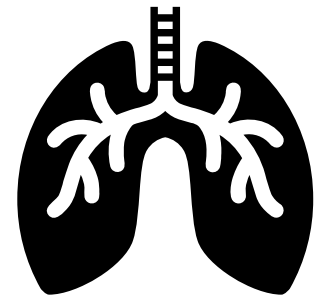
We have to collaborate.



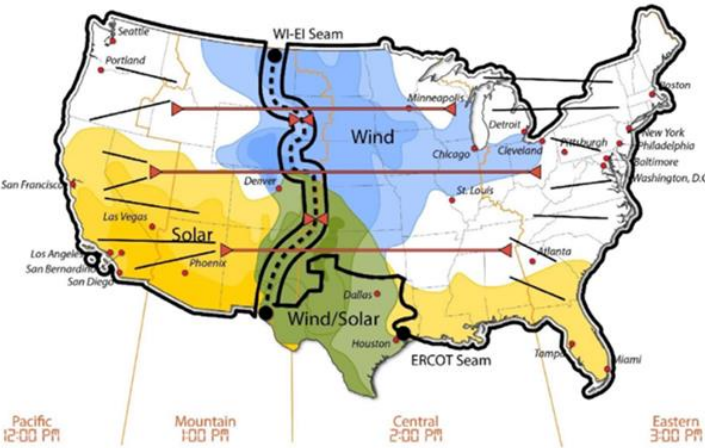
Remarks as Prepared for Delivery by U.S. Energy Secretary Jennifer M. Granholm at the 2022 Sydney Energy Forum, July 12, 2022

Legislation

- **Bipartisan Infrastructure Law (signed November 15, 2021)**
aka Infrastructure Investment and Jobs Act
- **CHIPS and Science Act (signed August 9, 2022)**
- **Inflation Reduction Act (signed August 16, 2022)**



Grid Trajectory Considerations



Loose Coupling

Agile/Flexible

Large-Scale Generation,
High-Voltage AC/DC
Grids + Storage

Variable, Integrative,
and Flexible Grid
across TD&C

Next-Generation Electricity Network

- Control of flexible generation and load
- Energy storage
- Synthetic inertia
- Multi-directional power flow
- Varied/variable grid configuration

Capital Intensive

Economies of scale

Strengthening the seam between the Eastern and Western Interconnections to encourage efficient development and utilization of U.S. energy resources.

Capital Diffuse

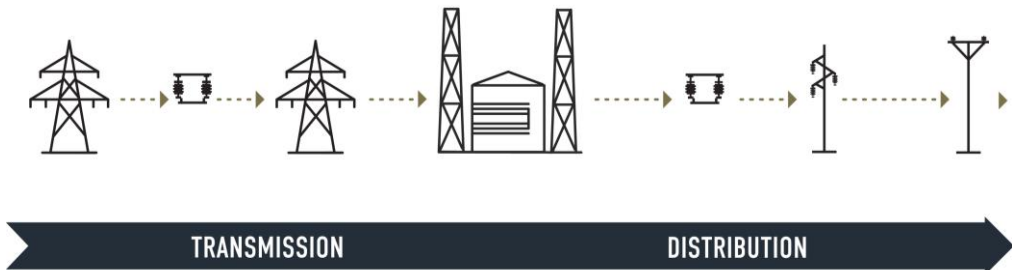
Network economies

Microgrids are a key part of the future Electricity Delivery System, enabling more decentralization and DER integration

- Current DER wave: PV, Smart Buildings
- Next DER wave: Energy Storage, EVs, IoT

Current Grid

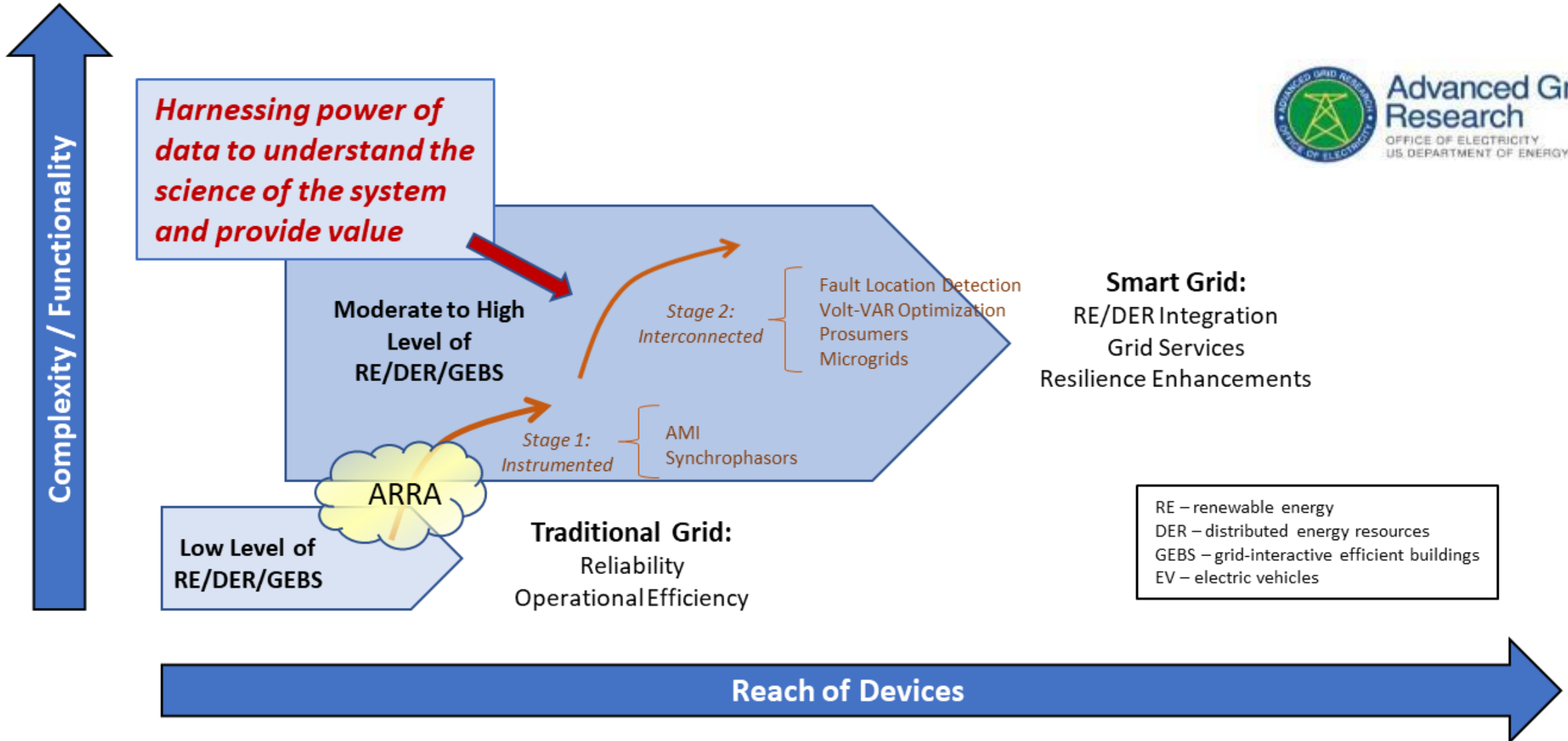
High DER + Complex
Industry Structure



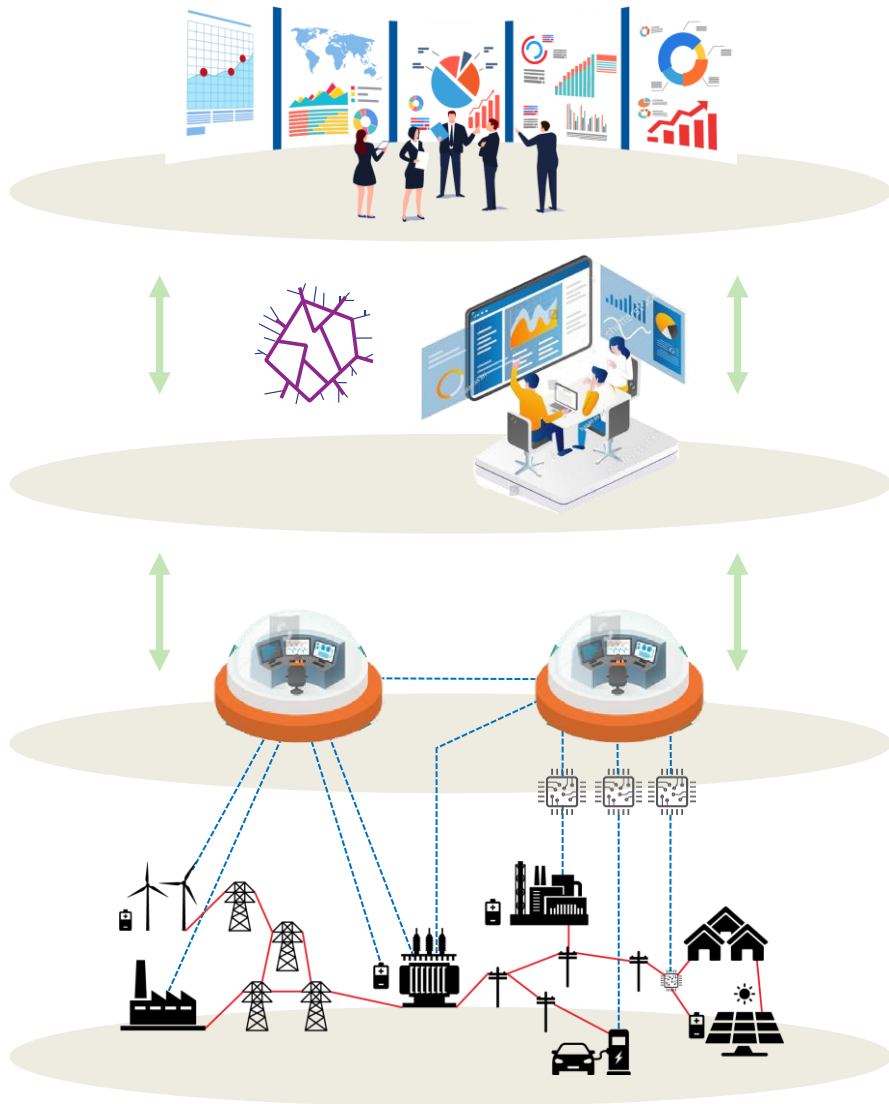
Tight Coupling

Rigid/Brittle

Recent Grid Research Focus



Concept Adapted from P. De Martini and J. Paladino (G. Bindewald)



Institutional Decision-Making

Institutional processes that align policies, customer expectations, and grid investment strategies AND that bridge the gap between technology development and adoption

Planning and Analysis

Modeling, simulation, and analytical tools to support holistic planning and system design (scenarios, options, architectures)

System Operations

Operations with real-time situational awareness, analytics, control, and coordination under varying system conditions, configurations, and market schemes

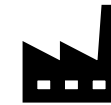
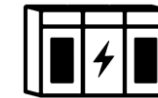
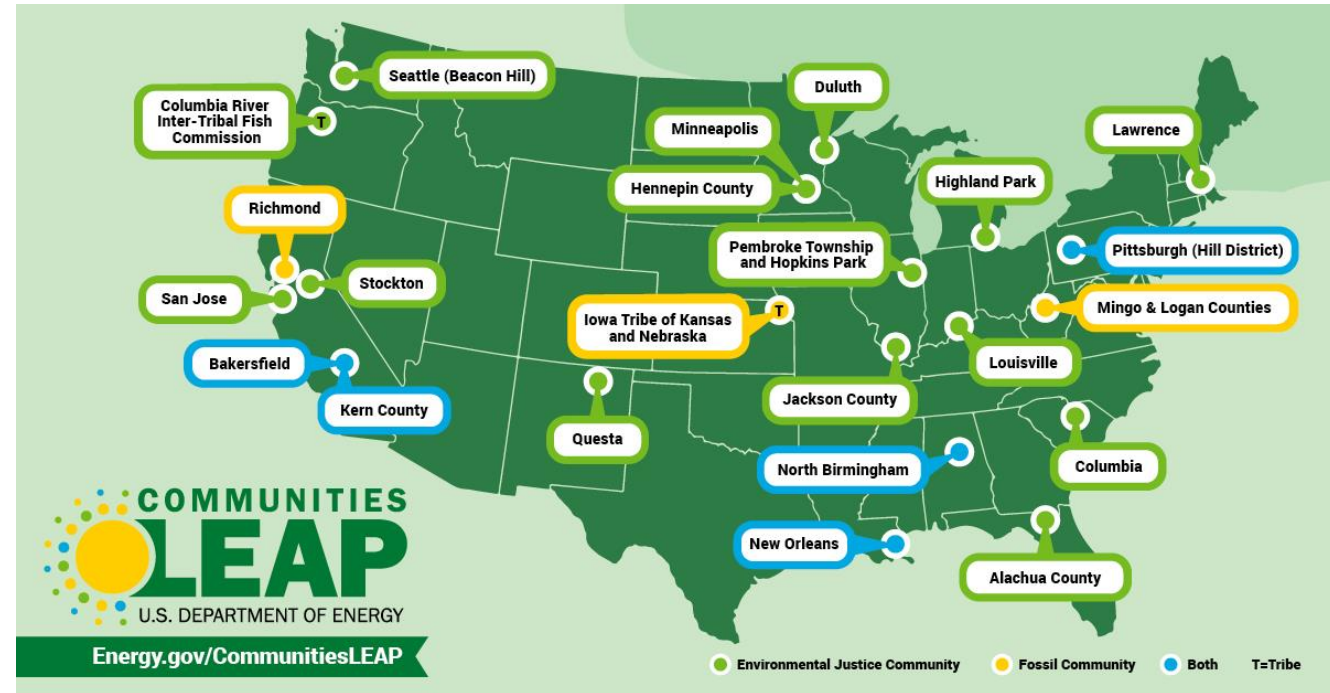
Components/Networks

Modular/sustainable systems and components with fast dynamics (power electronics)

Communities Local Energy Action Program (LEAP) Pilot

Sustained economic empowerment through clean energy deployment

- DOE-wide technical assistance pilot for 24 community-driven action plans.
- Multi-stakeholder community teams.
- For **low-income, energy burdened** communities also experiencing **direct environmental justice impacts**, and/or **direct economic impacts** from a shift away from historical reliance on fossil fuels.



Seven pathways: renewable energy, energy efficiency, clean transportation, microgrids, new/enhanced manufacturing, carbon capture and storage, energy site reclamation and critical minerals processing

DOE-OE Initiative ES4SE: Energy Storage for Social Equity

- **14 communities selected to receive detailed Technical Assistance**
- **5+ communities will be chosen to partner in constructing an energy storage facility.**
- **Fourteen communities: tribal, rural, and urban**

- Native Renewable, Flagstaff, AZ
- Cher-Ae Heights Indian Community Trinidad, CA
- Ayika Solutions Incorporated, Atlanta, GA
- Ho‘āhu Energy Cooperative Molokai, Kaunakakai, HI
- Together New Orleans, New Orleans, LA
- Honor the Earth, Callaway, MN
- Coast Electric Power Association, Kiln, MS

- Joule Comm. Power & Open Door Mission, Rochester, NY
- Warm Springs Community Action Team, Warm Springs, OR
- Rogue Climate, Coos Bay, OR
- Coyote Steals Fire Energy Group, Pendleton, OR
- Makah Tribe, Neah Bay, WA
- Klickitat Valley Health, Goldendale, WA
- Oneida Nation, Oneida, WI



<https://www.pnnl.gov/projects/energy-storage-social-equity>

Long Duration Storage Shot



Long Duration Storage Shot



Reduce storage costs
by **90%***...

*from a 2020 Li-ion baseline



...in storage systems
that deliver **10+** hours
of duration



...in **1** decade

Clean power anytime, anywhere.



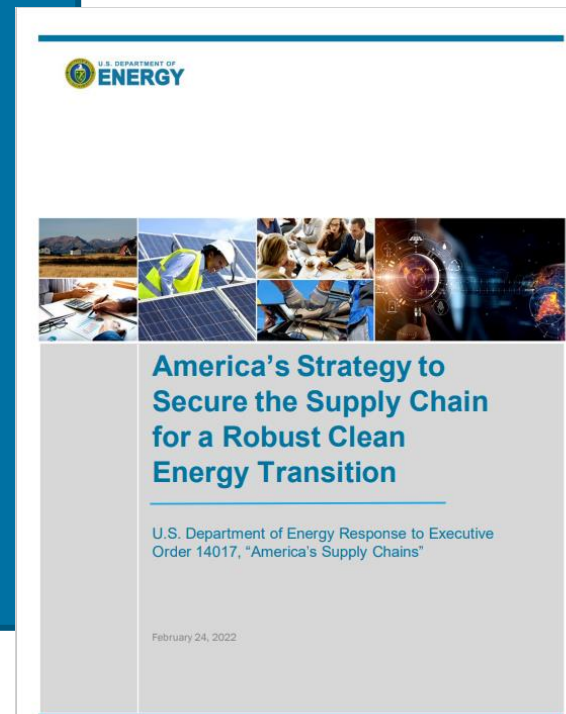
Executive Order 14017: America's Supply Chains (February 2021–2022)

- DOE released **14 reports on the energy sector supply chains**, including 13 issue-specific deep dive assessments and an overarching strategy report
- “America’s Strategy to Secure the Supply Chain for a Robust Clean Energy Transition” is the **first-ever comprehensive U.S. government strategy to secure our domestic energy supply chains and an Energy Sector Industrial Base**
- Lays out dozens of **critical strategies and actions** to build secure, resilient, and diverse domestic energy supply chains
- Part of a larger **whole-of-government approach** on supply chains

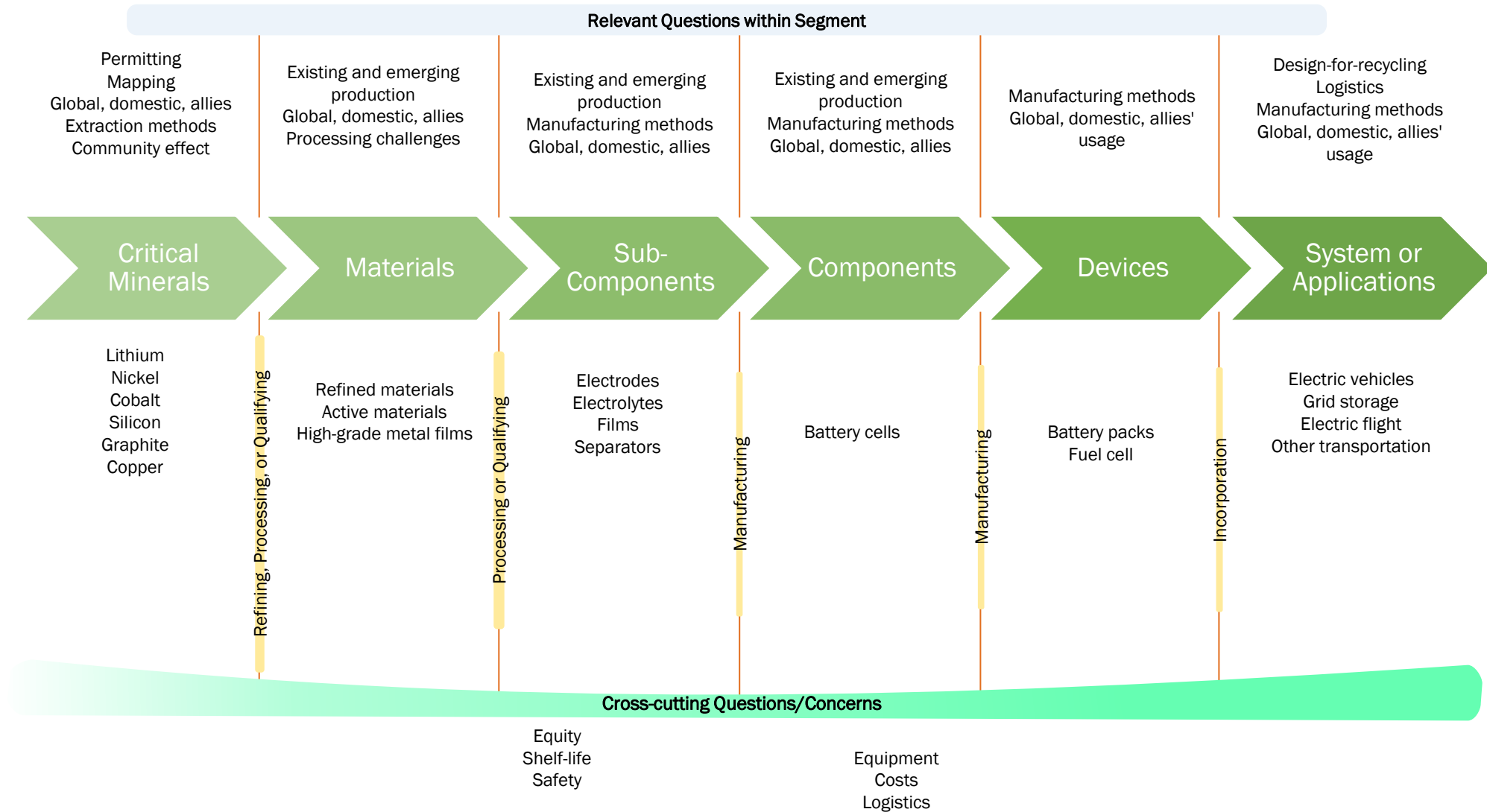
Deep-Dive Assessment Report Topics

- Carbon capture materials
- Electric grid including transformers and high voltage direct current
- Energy storage
- Fuel cells and electrolyzers
- Hydropower including pumped storage hydropower
- Neodymium magnets
- Nuclear energy
- Platinum group metals and other catalyst
- Semiconductors
- Solar photovoltaics
- Wind
- Commercialization and competitiveness
- Cybersecurity and digital components

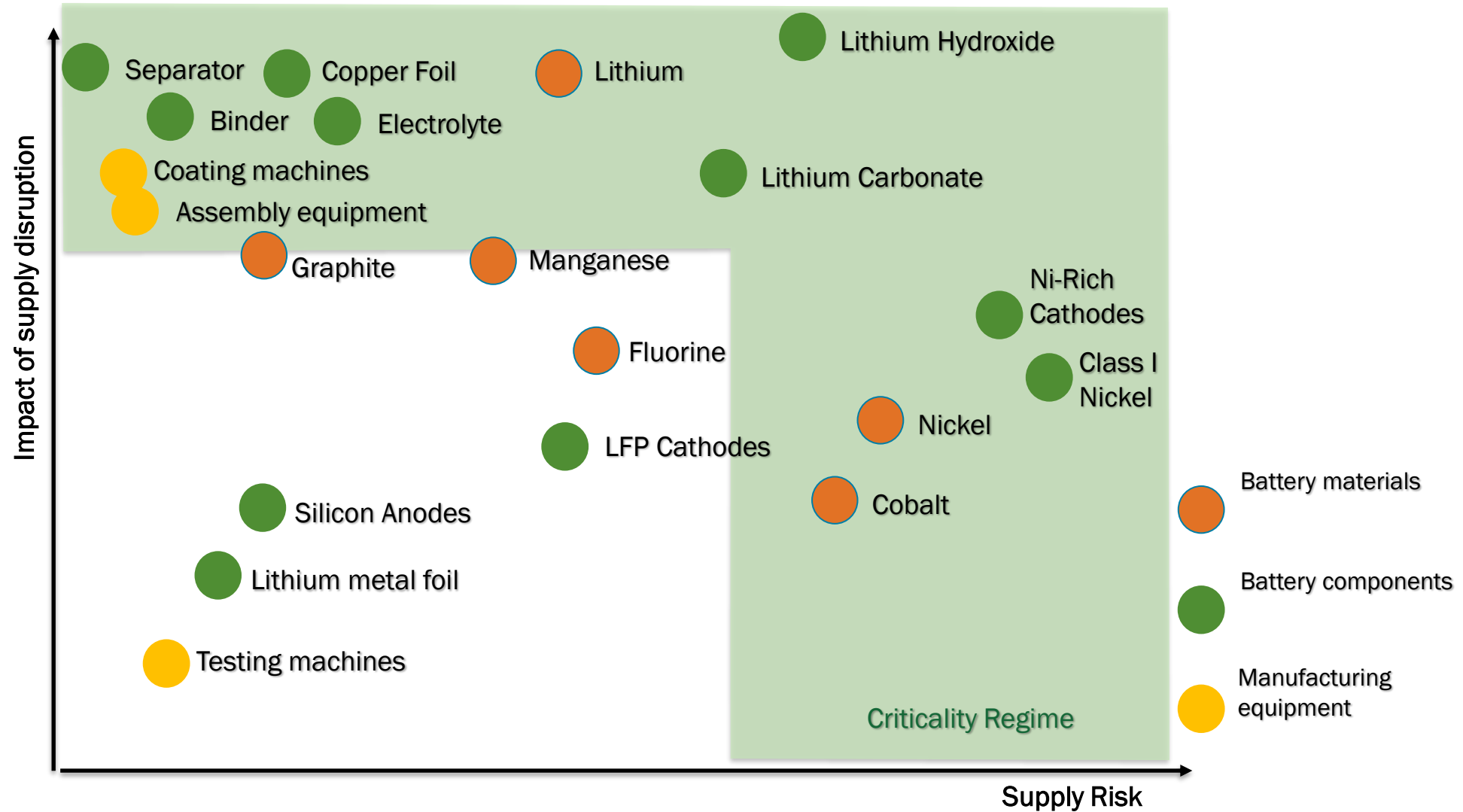
<https://www.energy.gov/policy/securing-americas-clean-energy-supply-chain>



Mapping Out the Lithium-ion Battery Supply Chain



Identifying Battery Supply Chain Criticalities



Multilateral Collaborations (Prime Examples)

Multilateral Collaborations (Prime Examples)



**Technology
Collaboration
Programme**
by **iea**



GLOBAL
CLEAN ENERGY
ACTION FORUM
CEM13/MI.7 USA 2022

BREAKTHROUGH
AGENDA





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Thank you!

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