THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC

INSTITUTE FOR INTERNATIONAL SCIENCE AND TECHNOLOGY POLICY
ELLIOTT SCHOOL OF INTERNATIONAL AFFAIRS

U.S. STI Policy

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17ο Σεμινάριο Ερμούπολης
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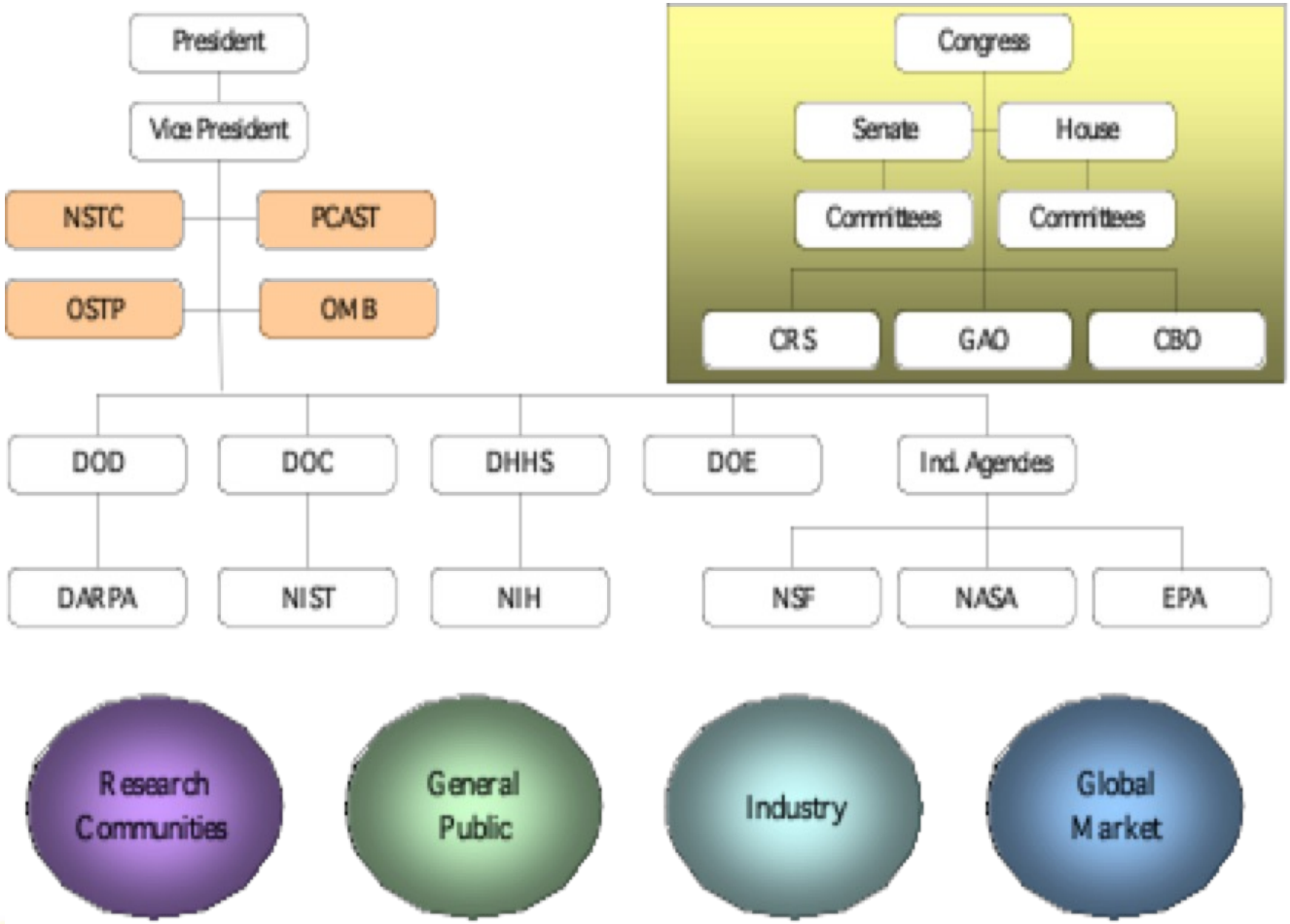
U.S. System for S&T Policy



Core principles of U.S. S&T Policy

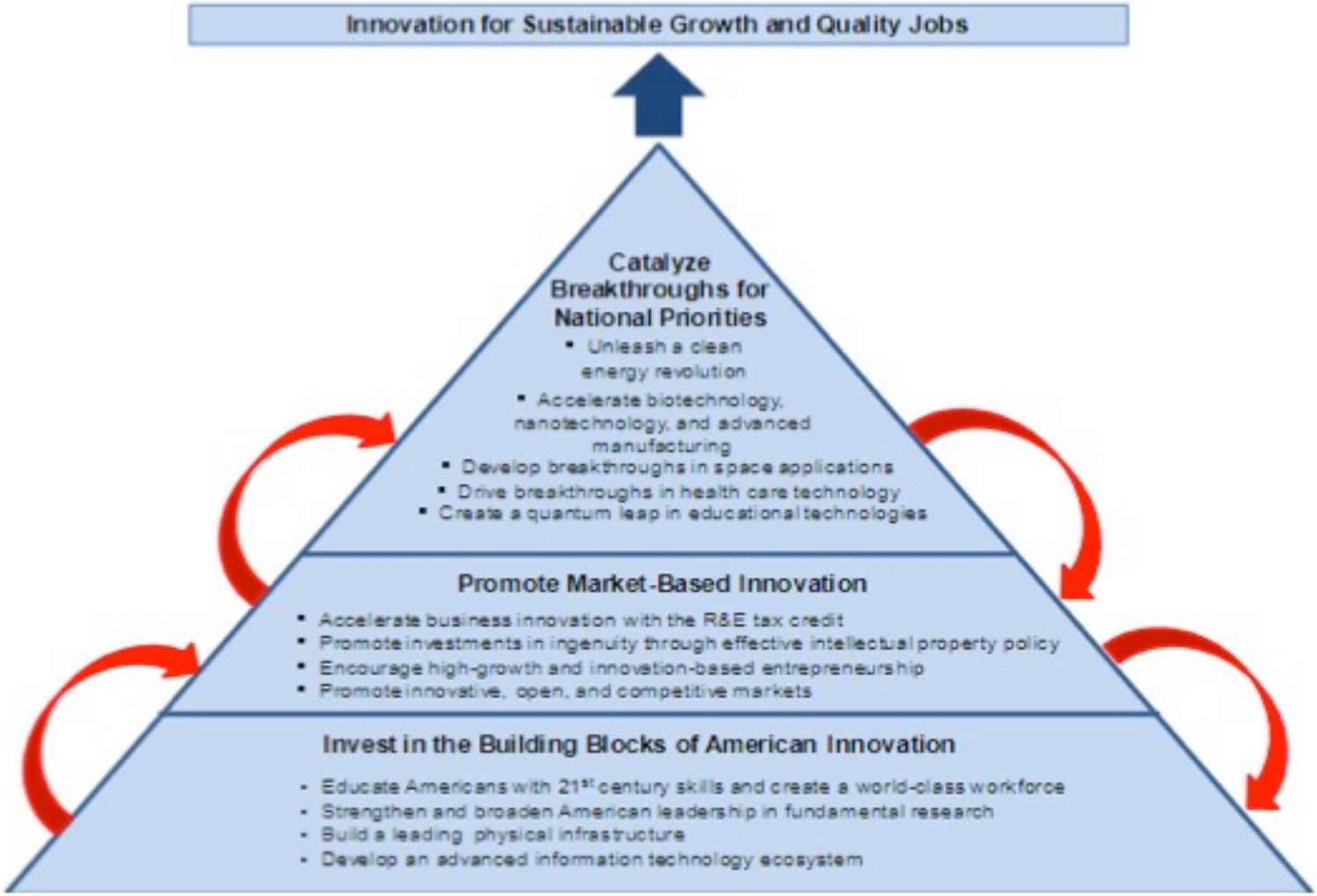
1. Basic science is a public good. Investments in science lead to new technologies and, occasionally, to new industries.

2. Federal agencies pursue the development of new technology for specific "missions" in activities with extensive public good characteristics.

3. The federal government refrains from "picking winners" through R&D investments.

4. The federal government creates the appropriate regulatory environment to enable efficient markets and to occasionally steer private sector investment in desired directions (e.g., toward environmentally benign technologies).

Strategy for American Innovation 2011



U.S. Innovation and Competition Act

Super Legislation:
U.S. Innovation and Competition Act

On June 8, 2021, the U.S. Senate passed the *United States Innovation and Competition Act (USICA)*, a $200 billion proposal for FY 2022-2026 aimed at countering China's influence domestically and abroad.

Bipartisan support – a "must-pass" legislation

This legislation was first introduced in 2020 by Senators Chuck Schumer (D-NY) and Todd Young (R-IN) as the *Endless Frontier Act (EFA)*.

EFA was dramatically expanded in the past weeks to include several additional provisions. EFA is now just one part (a division) within the expanded package renamed as the USICA.

Super Legislation:
U.S. Innovation and Competition Act

Division A – Creating Helpful Incentives to Produce Semiconductors (CHIPS) Act & ORAN 5G Emergency Appropriations

Division B – Endless Frontier Act (EFA)

Division C – Strategic Competition Act of 2021

Division D – Securing America's Future Act

Division E – Meeting the China Challenge Act of 2021

Division F – Other Matters

- Title I – Competitiveness and Security for Education and Medical Research
- Title II – Committee of the Judiciary
- Title III – Other Maters

Division B – Endless Frontier Act

Focuses on a long list of advanced technology areas including:

- Artificial Intelligence (AI)
- Quantum science
- New high-performance computing and semiconductors
- Robotics (and automation and advanced manufacturing)
- Biotechnology
- Cybersecurity
- Advanced materials
- Advanced energy technology
- Advanced communication technology

Division B – Endless Frontier Act

- Provides $81 billion over five years to the National Science Foundation (NSF). Of this, $26 billion for a new **Technology Directorate** for research through later stage technology development. It will also manage a competition for and fund University Technology Centers for later stage development through prototyping of these technologies – these can be single universities or consortia with universities and industry. The remainder of the funds are for existing NSF directorates.

- Provides $17 billion for basic research at the Office of Science (including its energy labs).

- Provides for regional scale-up, by funding, through the Commerce Department, "at least" ten regional innovation hubs run by consortia of industry, state and local government and education institutions.

Division B – Endless Frontier Act

- Directs the Commerce Department to monitor U.S. critical supply chain resiliency issues and has a broad and general authority to set up financing and support mechanisms for U.S. production funded at "such sums as are necessary."

- Adds provisions for the Commerce Department to greatly expand support for the Manufacturing Extension Partnership that works with small manufacturers.

- Increase funding for the Manufacturing USA institute network as well as to create additional institutes.

A slimmer version of the bill has been introduced as an NSF reauthorization bill in the House Science, Technology and Space Committee and that proposes creating a more modestly sized directorate that would address "societal challenges" rather than focus exclusively on technology.

Infrastructure Investment and Jobs Act

Infrastructure Investment and Jobs Act

Special infrastructure spending legislation, recently approved by Congress, provides about $1/2tr in new funding for priorities such as upgrading the electricity grid, transportation systems, and broadband networks.

Research and technology maturation are a relative minor focus of the bill. Still they receive ten of billions of dollars largely targeted to:

- commercial demonstration projects of DoE for carbon mitigation and hydrogen production
- R&D at DoE and US Geological Survey to reduce US dependence on foreign supplies of critical minerals.

Infrastructure Investment and Jobs Act

(Selected energy RD&D programs, $ in millions)

Carbon management	
Regional direct air capture hubs	3,500
Carbon capture demonstration and pilot programs	3,474
Carbon storage commercialization	2,500
Carbon dioxide transportation infrastructure loans	2,100
Industrial decarbonization demonstration projects	500
Carbon utilization program	310
Direct air capture prizes	115
Clean hydrogen	
Regional clean hydrogen hubs	8,000
Clean hydrogen electrolysis demonstration program	1,000
Clean hydrogen manufacturing and recycling program	500
Energy storage	
Battery material processing infrastructure grants	3,000
Battery manufacturing and recycling infrastructure grants	3,000
Energy storage demonstration projects	505
Battery recycling RD&D grants	125
Critical minerals and materials	
Mineral security projects	802
Rare earth elements demonstration facility	140
USGS Earth Mapping Resources Initiative	320
USGS energy and minerals research facility	167
Renewable energy	
Water power	156
Wind energy	100
Geothermal energy	84
Solar energy	80
Grid resilience	
Grid resilience and reliability demonstration projects	5,000
Nuclear energy	
Advanced reactor demonstration program	2,477
Advanced manufacturing	
"Future of Industry" program and industrial research centers	550

* All funds are for DOE unless otherwise noted

BUILDING RESILIENT SUPPLY CHAINS, REVITALIZING AMERICAN MANUFACTURING, AND FOSTERING BROAD-BASED GROWTH

100-Day Reviews under
Executive Order 14017

June 2021

A Report by
The White House

Including Reviews by
Department of Commerce
Department of Energy
Department of Defense
Department of Health and Human Services

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Sustainability in U.S. STI Strategy

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Executive Order 14008 (1/27/2021)

As soon as he took office, President Biden issued an Executive Order on "Tackling the Climate Crisis at Home and Abroad".

Part 1. Putting the climate crisis at the center of US foreign policy and national security – created new Special Presidential Envoy for Climate

Part 2. Taking a government-wide approach to the climate crisis

Use of the Federal government's buying power and real property and asset management

Empowering workers:

- Through rebuilding infrastructure for a sustainable economy.
- By advancing conservation, agriculture and reforestation
- Through revitalizing energy communities

Securing environmental justice and spurring economic opportunity

Executive Order 14057 (12/08/2021)

Ten months later, President Biden issued an Executive Order on "Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability". On the same date, the White House also issued the *Federal Sustainability Plan*. The Plan directs the Federal government to achieve net zero emissions by 2050. I.e., transition Federal infrastructure to zero-emission vehicles and energy efficient buildings.

The Office of the Federal Chief Sustainability Officer (CSO) is leading the implementation of this EO. This Office also issued the Federal Sustainability Plan. [Andrew Mayock CSO]

The Office of the CSO is part of the White House Council on Environmental Quality (CEQ) which coordinates the federal efforts to improve, preserve and protect the country's public health and environment.

Created in 1969, CEQ advises the President and develops policies on climate change, environmental justice, federal sustainability, public lands, oceans, and wildlife conservation, among others. CEQ is part of the Executive Office of the President (https://www.whitehouse.gov/administration/executive-office-of-the-president/)

Federal Sustainability Plan

Catalyzing America's Clean Energy Industries and Jobs

December 2021

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		Actions	CFE	Fleet	Buildings	Procurement	Adaptation	Net-Zero Emmisions Operations by 2050
1	100% Carbon Pollution-Free Electricity (CFE) by 2030, including 50% on a 24/7 basis	Aggregate CFE purchases across regions and agencies	•	•	•	•	•	•
		Seek ways to pilot and accelerate promising CFE sources	•		•	•	•	•
		Develop public and private sector partnerships	•			•		•
		Establish the 100% 24/7 CFE Federal Leaders Working Group	•			•		•
2	100% Zero-Emission Vehicle (ZEV) Acquisitions by 2035, including 100% light-duty acquisitions by 2027	Optimize agency fleet management		•	•	•	•	•
		Align financial planning		•	•	•		•
		Expand vehicle charging infrastructure	•	•	•	•	•	•
		Improve workforce understanding and effect cultural change		•	•	•		•
		Provide State, Tribal, and local government fleets opportunities to benefit from Federal efforts		•		•		
		Establish the ZEV Fleets Federal Leaders Working Group	•					•
3	Net-Zero Emissions Buildings by 2045, including a 50% reduction by 2032	Build for net-zero emissions	•	•	•	•	•	•
		Implement the Federal Building Performance Standards	•		•	•		•
		Increase energy and water efficiency	•	•	•	•	•	•
		Reduce waste, minimize use of toxic materials, and drive markets for recycled products			•	•		•
		Achieve higher levels of sustainability in owned and leased buildings	•	•	•	•	•	•
		Leverage private sector investment	•	•	•	•	•	•
		Drive sustainable and equitable siting	•	•	•			
		Establish the Net-Zero Emissions Buildings Federal Leaders Working Group			•			•

		Actions	CFE	Fleet	Buildings	Procurement	Adaptation	Net-Zero Emmisions Operations by 2050
4	Net-Zero Emissions Procurement by 2050	Require major Federal suppliers to publicly disclose GHG emissions and climate risks, and set science-based targets to reduce emissions	•	•	•	•		•
		Launch a Buy Clean intiative for low-carbon materials		•	•	•		•
		Change Federal procurement rules to minimize the risk of climate change, including factoring in the social cost of GHG in to procurement decisions	•	•	•	•	•	•
		Maximize the procurement of sustainable products and services	•	•	•	•	•	•
		Establish the Net-Zero Emissions Procurement Federal Leaders Working Group, including a Buy Clean Task Force	•	•	•	•	•	•
5	Net-Zero Emissions Operations by 2050, including a 65% reduction by 2030	Use 100% CFE by 2030, including 50% on a 24/7 basis	•					•
		Achieve 100% ZEV Acquisitions by 2035		•				•
		Achieve Net-Zero Emissions Buildings by 2045			•			•
		Achieve Net-Zero Emissions Procurement by 2050				•		•
		Partner with public, private, and nonprofit sector leaders	•	•	•	•		•
6	Climate Resilient Infrastructure and Operations	Routinely assess climate vulnerabillities and risks	•	•	•	•		•
		Modernize Federal policy, programs, operations, and infrastructure to support climate resilient investment	•	•	•	•		•
		Establish the Climate Adaptation and Resilience Federal Leaders Working Group	•	•	•	•		•

EO 14057 Federal Procurement Goals

In order to achieve net-zero emissions by 2050, the Executive Order and the accompanying "Federal Sustainability Plan" set four primary goals:

1. *Power:* 100 percent carbon pollution-free electricity on a net annual basis by 2030;
2. *Vehicles:* 100 percent zero-emission vehicle acquisitions by 2035, including 100 percent zero-emission light-duty vehicle acquisitions by 2027;
3. *Buildings:* A net-zero emissions building portfolio by 2045, including a 50 percent emissions reduction by 2032; and
4. *Materials:* Net-zero emissions from federal procurement no later than 2050, including a Buy Clean policy to promote use of construction materials with lower embodied emissions.

THANK YOU!!

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