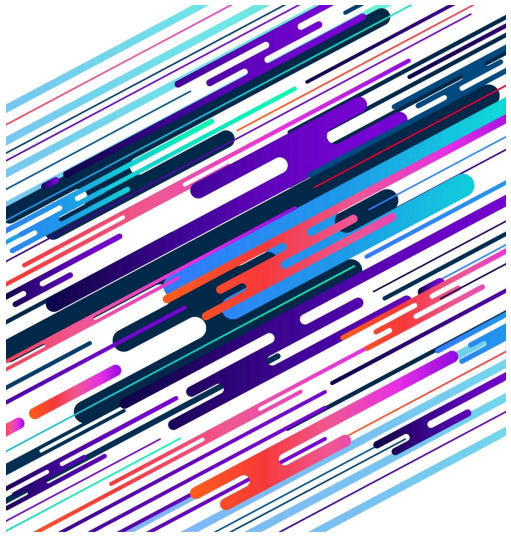
MARYLAND-DISTRICT OF COLUMBIA UTILITIES ASSOCIATION

2023 Environmental Conference

Tom Peterson

Center for Climate Strategies

October 13, 2023



THE CENTER FOR CLIMATE STRATEGIES

Climate Finance

What is it?	Where does it lead?	What scale is it?	What does it require?
• Technology finance • Management finance	• Upstream capitalization • Downstream distribution	• Policy and market level • Program level	• Best practices • Capacity expansion

Core Tasks

Planning	Measurement	Matching	Mechanisms	Cooperation
Partnerships	Programs	Capacities	Innovation	Assistance

Work Plan

READINESS

RESOURCING

IMPLEMENTATION

Climate Change Catalytic (C3) Fund

	STRATEGIES					
	ENERGY	BUILDINGS	TRANSPORTATION	AG/ FORESTRY	WASTE	CROSS CUTTING
AUDIENCES	RE GENERATION, TRANSMISSION; COST REDUCTION & RESILIENCE	EE, WEATHERIZATION, DEMAND MANAGEMENT, STORAGE, HVAC and ELECTRIFICATION MEASURES or TECHNOLOGIES to MEET BEPS REGS by 2025	ZERO EMISSION VEHICLES & INFRASTRUCTURE, HYDROGEN FUEL , SUSTAINABLE AVIATION FUELS	ENERGY FROM WASTE AND RENEWABLE BIOMASS SOURCES THAT MEET OR EXCEED MD GHG EMISSIONS REGULATIONS, CARBON SEQUESTRATION. ALTERNATIVE SOURCES FOR FOSSIL FUEL USES LIKE FERTILZER, DIESEL and PROPANE DISPLACEMENT.	SOURCE REDUCTION & REUSE; CHP STEAM; METHANE CAPTURE; ENERGY FROM SOLID & LIQUID WASTE SOURCES THAT MEET OR EXCEED MD GHG EMISSIONS REGULATIONS	WORKFORCE SKILLS TRAINING & ON THE JOB EXPERIENCE; CAPACITY BUILDING; OUTREACH & EDUCATION; PLANNING & ASSESSMENT
CONSUMER						
SMALL BUS/ COMMERCIAL						
INDUSTRIAL/ MANUFACTURING						
PRODUCERS/ DISTRIBUTORS						
MUNICIPAL/ INSTITUTIONAL						
NGOS						
ENTREPRENEURS						

Source: MCEC, 2023

Maryland LEAP Model

Low Emissions Analysis Platform

46,000 Users in 190 Countries

Technology, finance, and equilibrium based

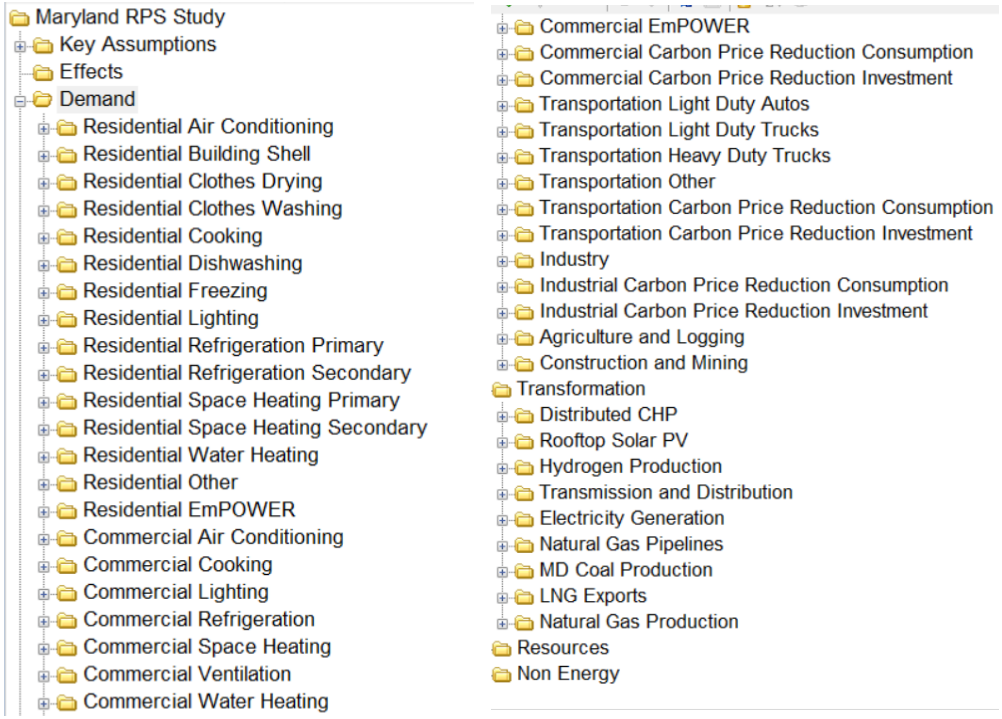
Empirical scenarios, dispatch, optimization

Short and long-term actions

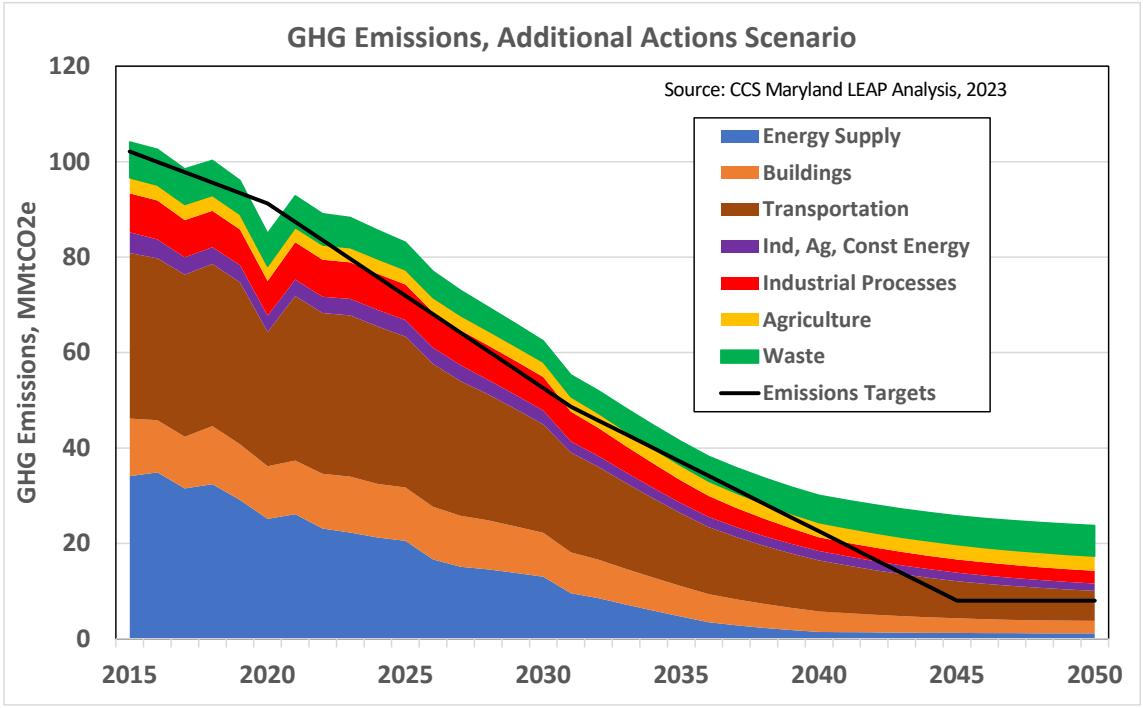
Multi objective, multi metric

Flexible, model-building tool

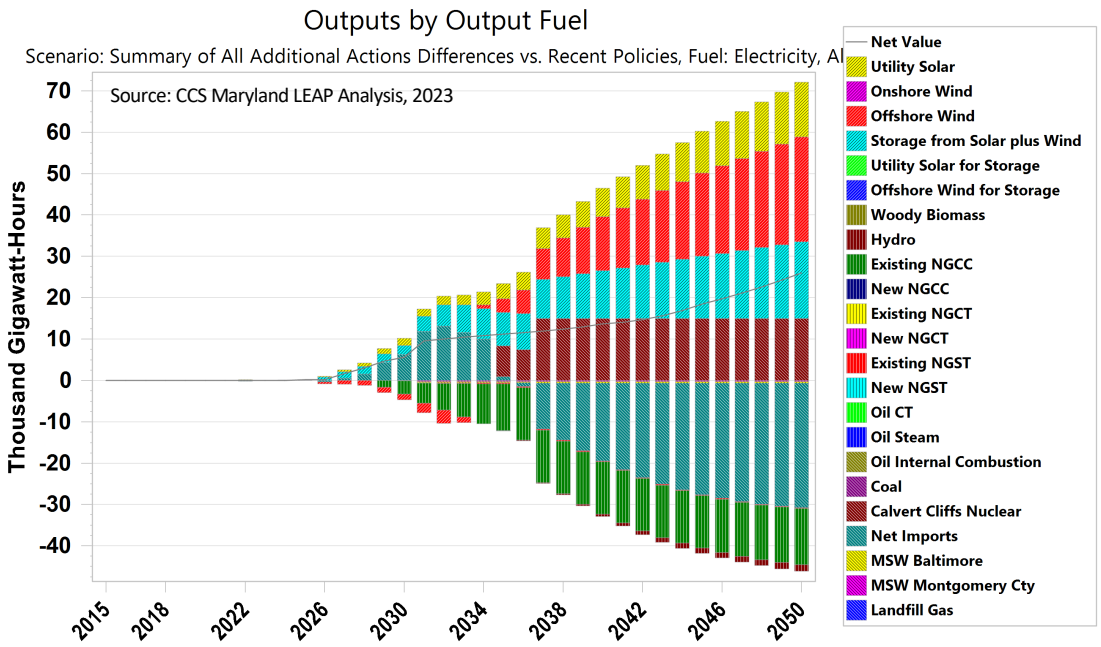
Source: CCS Maryland LEAP Analysis, 2023



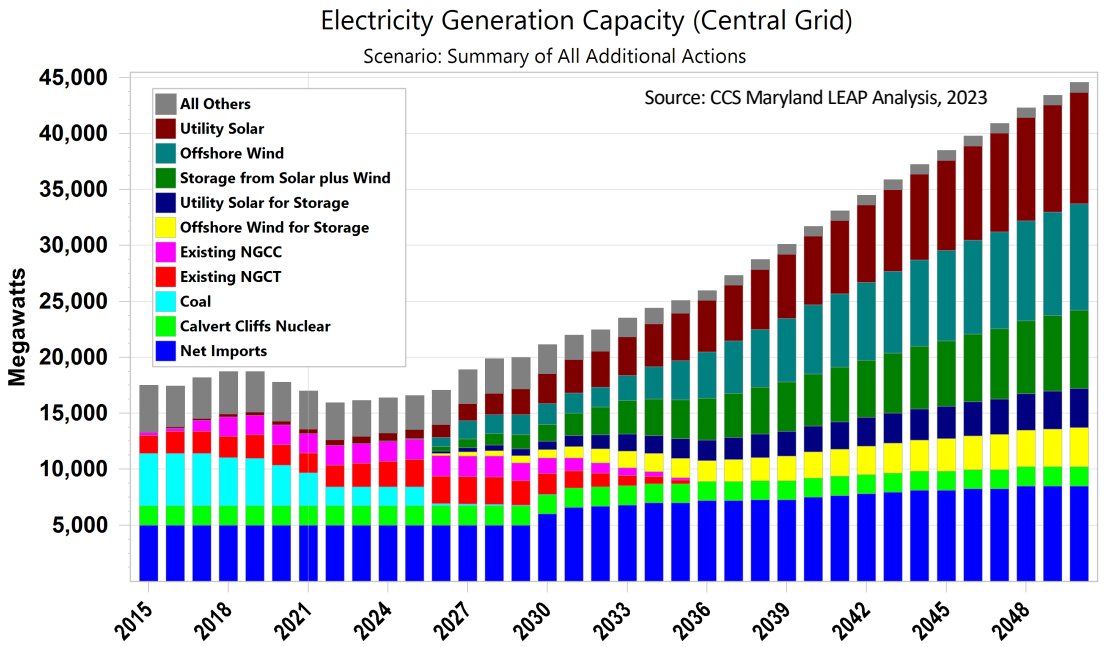
Maryland GHG Reductions



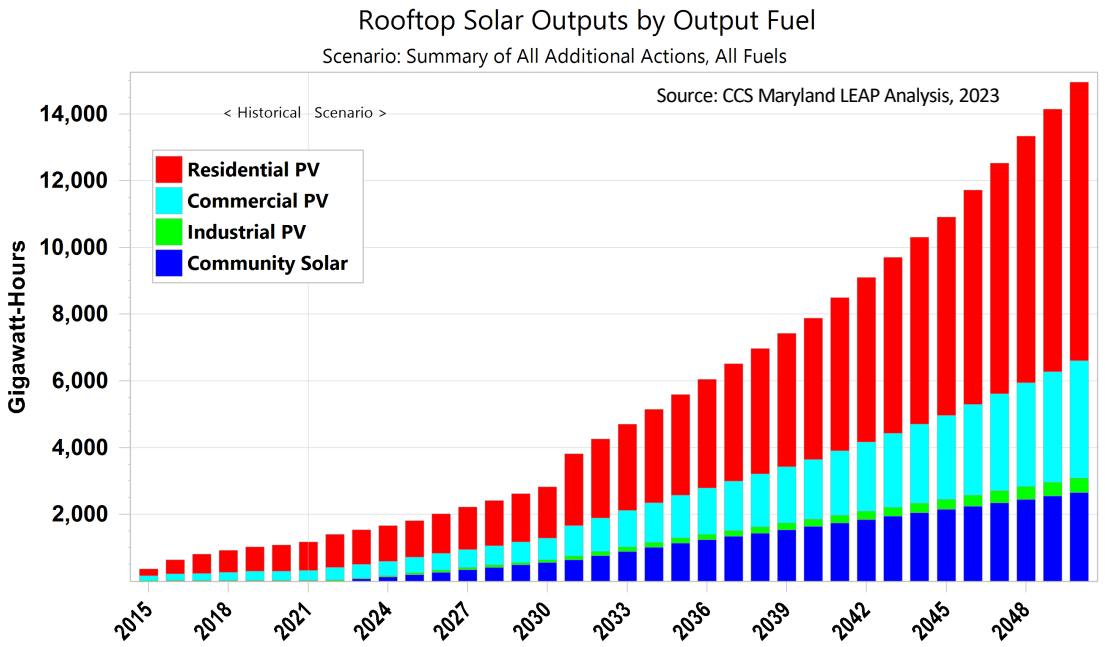
Energy Transition



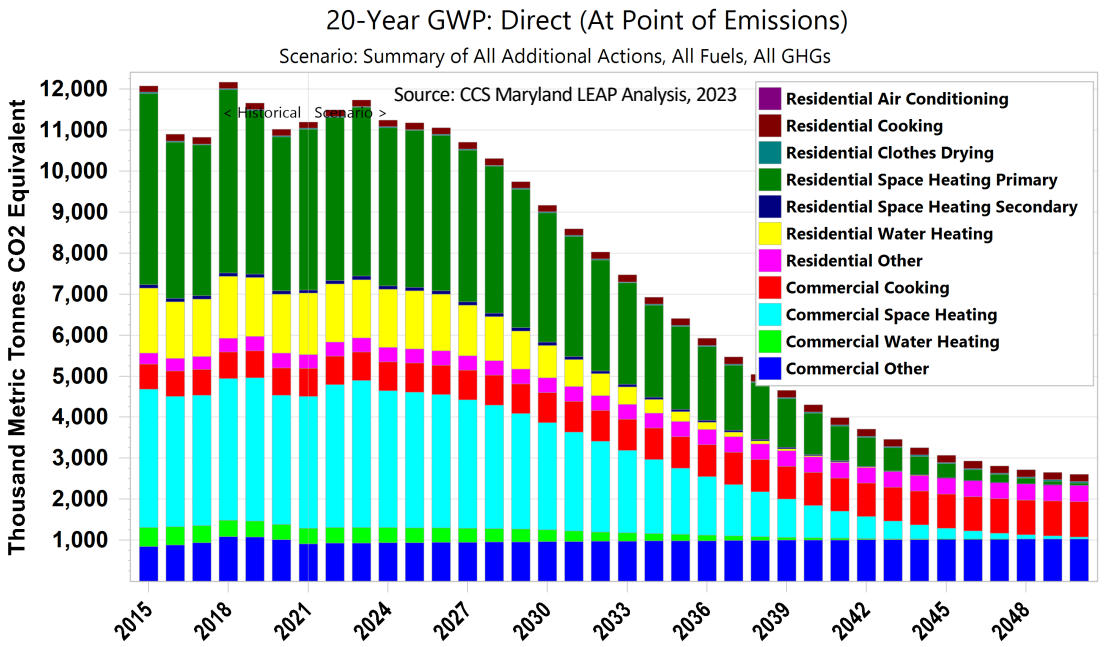
Electricity Transition



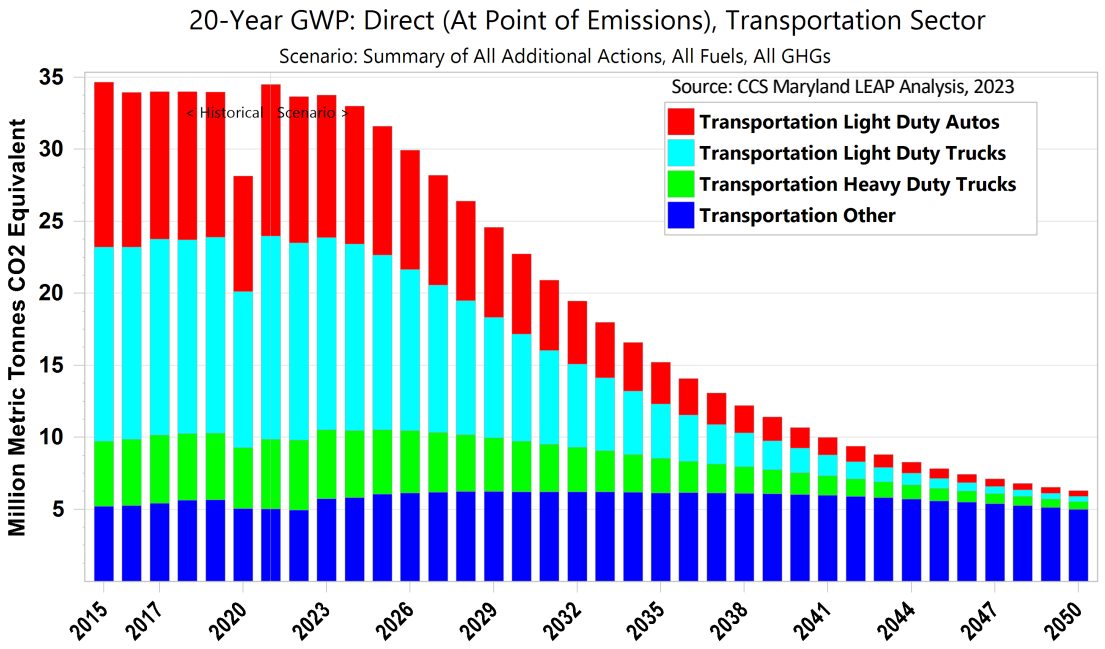
Solar Transition



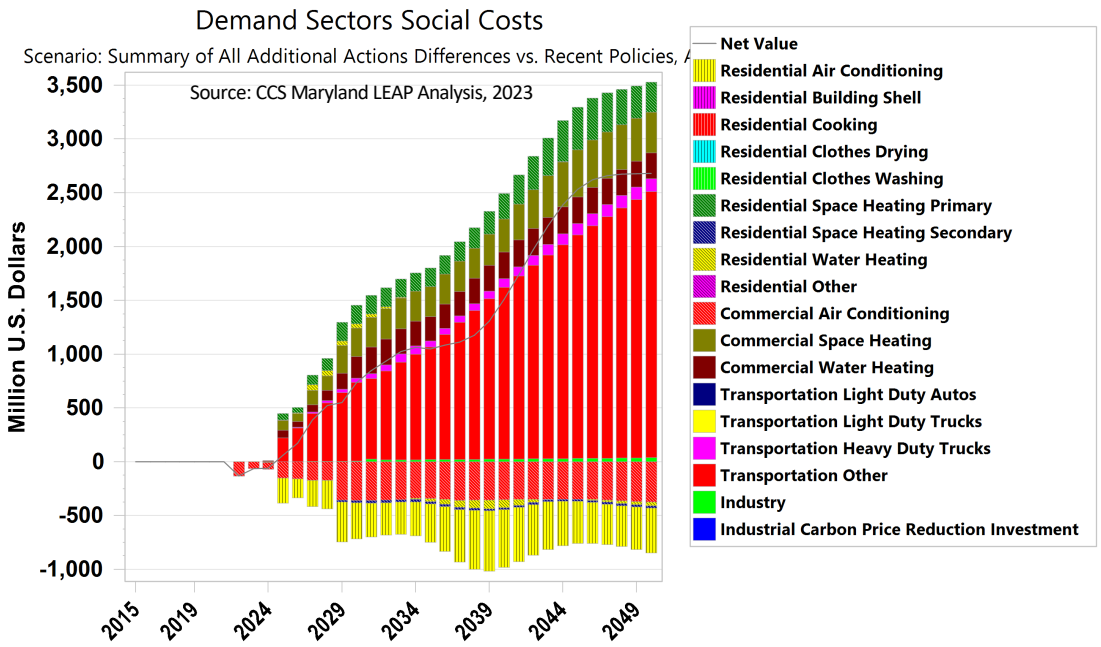
Buildings Transition



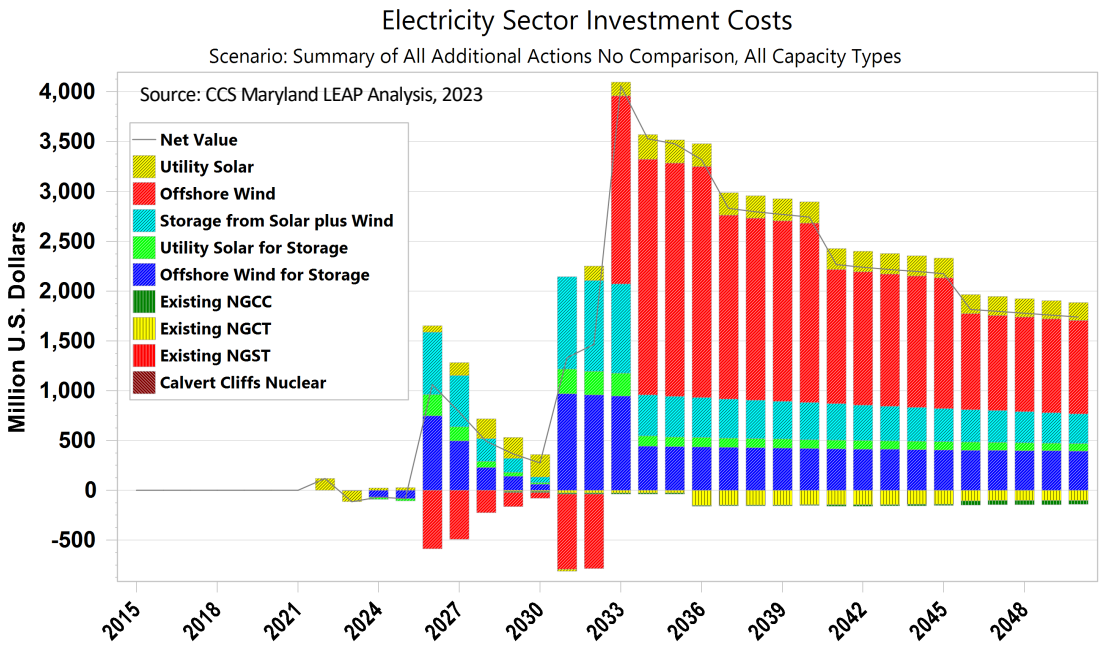
Transport Transition



Investment Transition, Buildings



Investment Transition, Electricity



Social Costs/Savings Beyond Current Policies*

**$M, annualized, 5% discount rate*

Draft Partial Results

Source: CCS Maryland LEAP Analysis, 2023

CATEGORY	2024-31
Energy Demand	$ 1,356
Residential Space and Water Heating	$ (428)
Commercial Space and Water Heating	$ 342
Transportation-- Heavy Truck Electrification, Rail Expansion, Bus Service	$ 1,399
Industry--Cement Kiln Electrification and Electrification of Industry	$ 42
Other Demand	ND
Energy Supply	$ 2,515
Rooftop Solar	$ 258
Transmission and Distribution	$ 243
LNG Exports	$ 31
Electricity Generation--Offshore Wind	$ 845
Electricity Generation--Solar	$ 533
Electricity Generation--Storage	$ 770
Electricity Generation--Avoided Fossil	$ (136)
Electricity Generation--Calvert Cliffs Life Extension	$ -
Electricity Generation, Retirement of Waste-to-Energy Plants	$ (21)
Electricity, Other	$ (1)
Others	$ (7)
Non-Energy	ND
Resources	$ (1,986)
OVERALL ESTIMATED TOTAL	**$ 1,885**
GHG Emissions Reduction	
Annual at End Year	(10.18)
Cumulative to End Year	(29.62)
Implied Cost per tCO2e Reduced	$ 63.64
Externality Benefits at $191 per tCO2e	**$ (5,147)**
Net Cost Including Externality Benefit	**$ (3,262)**

Investment Outlays Beyond Current Policies*

**$M, cash-based, undiscounted, no financing*

Draft Partial Results

Source: CCS Maryland LEAP Analysis, 2023

CATEGORY	2024-2031
Energy Demand	$ 3,686
Residential Space and Water Heating	$ (713)
Commercial Space and Water Heating	$ 527
Transportation--Additional Heavy Truck Electrification, Expansion of Rail and Bus Service	$ 3,805
Industry--Cement Kiln Electrification and Electrification of Industry	$ 66
Other Demand	ND
Energy Supply	$ 5,778
Rooftop Solar	$ 1,111
Transmission and Distribution	$ 312
LNG Exports	$ 31
Electricity Generation--Offshore Wind	$ 210
Electricity Generation--Solar	$ 1,528
Electricity Generation--Storage	$ 2,495
Electricity Generation--Avoided Fossil	$ (86)
Electricity Generation--Calvert Cliffs Life Extension	0
Electricity Generation, Retirement of Waste-to-Energy Plants	37
Overall OPEX Cost Difference from Changes Above	$ 140
Other Energy Supply	$ 0.09
Non-Energy	ND
OVERALL ESTIMATED TOTAL	**$ 9,464**
FOR REFERENCE, ESTIMATED MARYLAND GDP (8 years)	**$ 4,000,000**
ESTIMATED INVESTMENT AS A FRACTION OF GDP	**0.237%**

Social Costs/Benefits, Financial Investments

Draft Partial Results, 2024-0231

Net Social Costs/Benefits with SCC = *$3.3B net benefit*

- SCC $191/ton + direct economic costs/savings, annualized, 5% discount rate

Net Social Costs/Benefits without SCC = *$1.9B net cost*

- Direct economic costs/savings, annualized, 5% discount rate

Investment Requirements = *$9.5B outlay*

- Direct + avoided outlays, cash-based, undiscounted, not financed

Notes

No indirect and non-market benefits or costs

- Employment, economic growth, productivity, human and ecosystem health, social equity, innovation, vulnerability reduction, etc.

Policies and programs continue well past 2031

- Annualized social costs/savings to 2050, whereas cash investments occur by 2031 and are not financed over the full implementation period

Potential sources include existing and new (reprogrammed) funds

Source: CCS Maryland LEAP Analysis, 2023

Solar For All Grant

Household Projects to Benefit	16,104
• Total EPA GGRF SFA Award Request	$100,000,000
• Award Funding Requested Per Household	$6,210
• MW Solar Capacity Deployed Over Time	57.5
• MW Hours of Storage Capacity Deployed Over Time	37.8
• Short Tons of CO_2 Emissions Avoided Over 20 Years	890,000
• Absolute Annual Household Savings Over 20 years	$105,000,000

Source: MCEC/CCS Maryland SFA Analysis, 2023

Thank you!

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