Commonwealth of Massachusetts

Executive Office of Energy and Environmental Affairs

Massachusetts Environmental Policy Act

MEPA GHG Emissions Policy

June 10, 2022

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2010 MEPA GHG Emissions Policy

Key Components

- For stationary sources: energy modeling to determine whether project will exceed Base Code requirements ("% better")

- For mobile sources: quantification of estimated vehicle miles traveled (VMTs) for the project and any mitigation measures

- Potential additional sources: incl. "unusually large amount" of forest/land clearing, construction activity, industrial processes

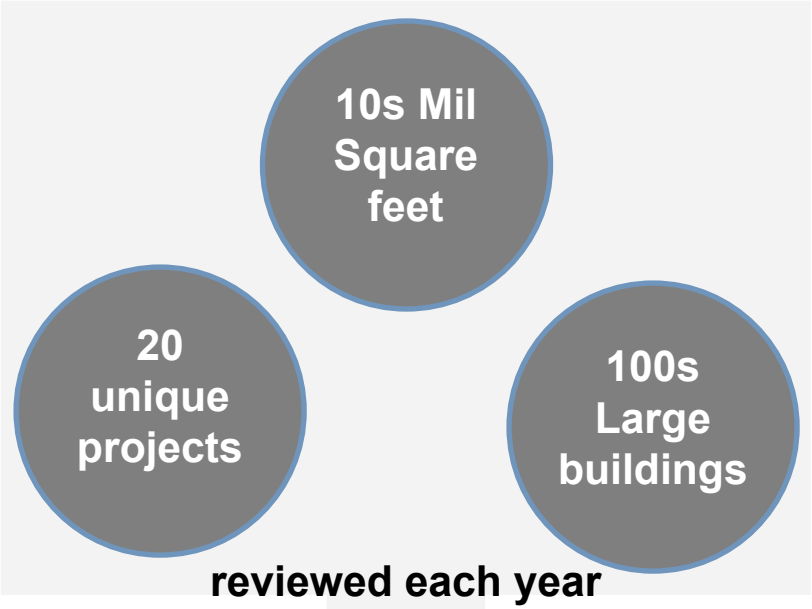
- Applies to EIR projects (mandatory and discretionary) and requires "GHG Self-Certification" to be filed with "as built" plans

MEPA GHG Emissions Policy

Stationary Sources

Recent MEPA GHG Reviews

The Department of Energy Resources (DOER) has provided technical review on MEPA projects since 2010. MEPA reviews have resulted in significant mitigation over the last two years for GHG emissions impacts of new building construction.



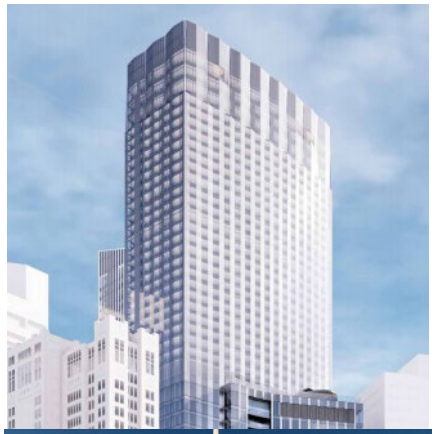
MEPA outcomes in last 2 years

- About 90% residential electrified
- About 70% office electrified
- About 90% office-lab hybrid electrified
- 1000's of Passivehouse units
- New attention to envelope, air infiltration, and heat recovery – the "trifecta" needed for electrification and decarbonization

Significant ripple effect across industry

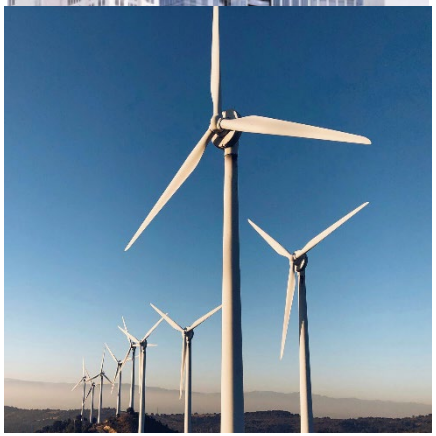
Recent MEPA GHG Reviews

MEPA reviews have sought to encourage energy efficiency strategies that have the most impact in reducing GHG emissions.



Envelope and air infiltration

Passivehouse and energy recovery



Space and water electrification

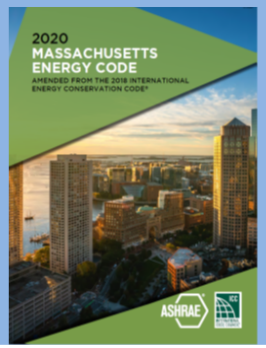
Solar and EV readiness

2022 DOER Energy Code Straw Proposal

The stretch code since 2008 has been based on a "% better" approach adopted from LEED. The 2010 MEPA GHG Policy was aligned with this approach.

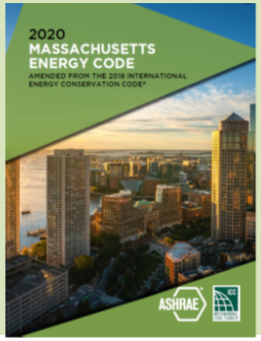
Base Energy Code

52 municipalities that are not designated Green Communities



Stretch Energy Code

299 municipalities that are or plan to become a Green Community



Base energy code last updated February of 2020, Stretch code last updated in January of 2017

One integrated MA energy code book viewable on the ICC website

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2022 DOER Energy Code Straw Proposal

The proposed updated stretch and "specialized opt in" code replaces a "% better" approach with a focus on specific energy efficiency strategies. These code updates are intended to provide a pathway to meet 2050 decarbonization goals.

Base Code
(10th Edition of MA Building Code)

- New Buildings in towns and cities that have not adopted a stretch code
- 52 communities
- BBRS update effective in 2023

Stretch Code
(Update)

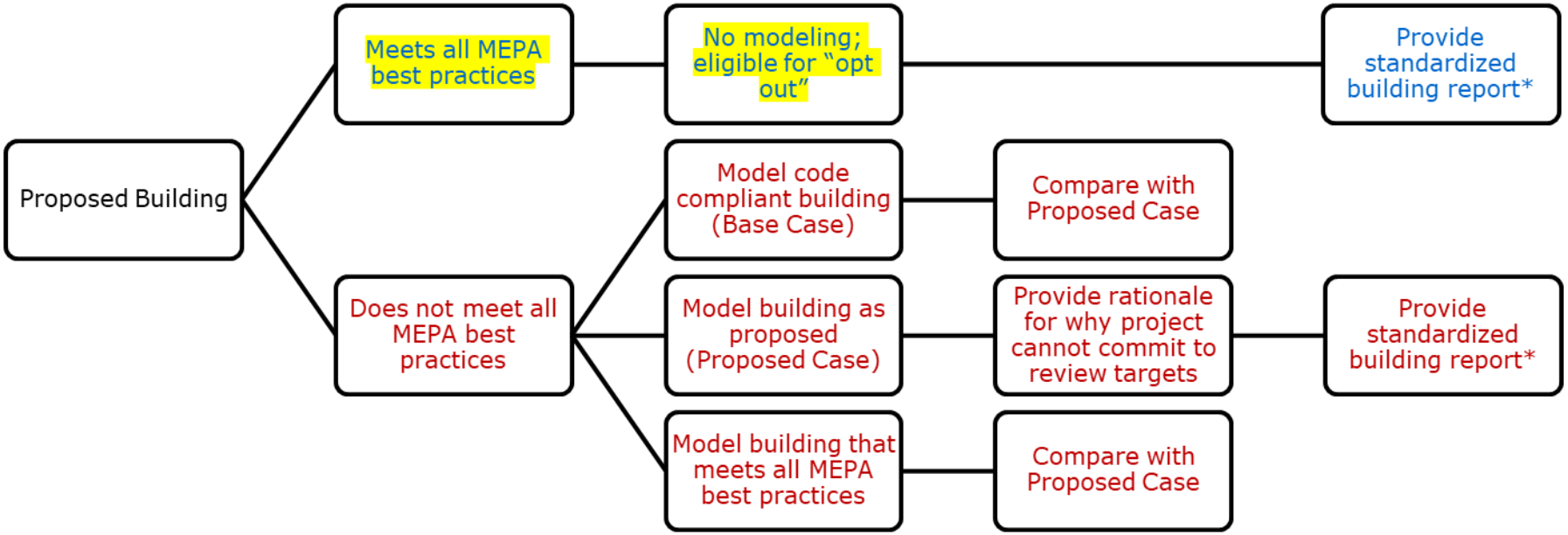
- New Buildings in towns and cities that adopted, including all green communities
- 299 communities
- DOER update effective in 2023

Specialized Opt-in
(New Code Option)

- New Buildings in towns and cities that choose to opt-into this code
- Available for adoption Dec 2022

MEPA GHG Emissions Policy: Potential Updates

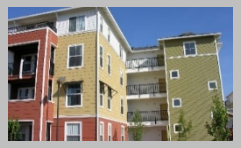
Update #1: Simplify MEPA Process by Creating "Opt-Outs" for High Level Mitigation Commitments. Standardize Analysis for Other Projects.



*See appendix for sample building report.

MEPA GHG Emissions Policy: Potential Updates

Update #1 (*cont.*): Standard Analysis Would Model Effective GHG Reduction Strategies, Consistent with Current Practice.

	Thermal Limits	Envelop, air infiltration, energy recovery	Electrification	Passivehouse and Reduced HERS	PV, EV, Energy Storage
					
Proposed Stretch Code & Opt In Code	• Sets maximum allowable heating and cooling demand limits (applicable to certain commercial buildings)	• Envelope backstops, better energy recovery and air infiltration	• Hybrid electrification mandatory for lab/offices • Electrification readiness for other bldgs	• HERS reduced to 42/45 for small residential • Passivehouse mandatory for multi-family as of 2024	• PV readiness • PV required if feasible for gas heated bldgs • EV readiness
MEPA Best Practices	• Same	• Same	• Full electrification strategy with exceptions for certain building types	• Passivehouse strategy for multi-family	• PV readiness • EV readiness + % installation targets

MEPA GHG Emissions Policy: Potential Updates

Update #2 (Technical): Revise How Mitigation Commitments are Expressed.

- **Current: Commitments are expressed as "% better" than Base Code.**
  - **Issue:** All improvements are treated the same, with strategies such as improvements to envelope and reduction in peak load (which achieve better GHG reductions) given equal footing as other strategies; comparison to Base Code is now sorely outdated.

- **Proposed: Revise "% better" measure to be calculated from legally mandated code in the community, and add specific commitments such as:**
  - Electrification of space heating
  - Electrification of water heating
  - Heating and cooling load reduction
  - Envelope and air infiltration
  - Rooftop solar readiness
  - Energy recovery
  - Peak load reduction
  - Passivehouse

MEPA GHG Emissions Policy: Potential Updates

Update #3 (Technical): Revise Modeling Methodology to Consider Reductions in Overall Grid Emissions by 2050.

- **Current: Energy modeling evaluates building improvements as of a single year.**
  - **Issue:** Modeling does not consider improvements to grid emissions, thereby understating benefits of electrification over time. In addition, single year is measured as of time of MEPA review, so code updates at time of construction are not considered.

- **Proposed: Move to 30 year look ahead to fully capture GHG reduction benefits of building improvements.**
  - Apply grid emissions rate as of 2050 when evaluating the anticipated emissions benefits of specific EE strategies.
  - Still allow for consideration of cost feasibility at the time of construction.

Appendix: Sample Building Report for Projects Committing to MEPA Best Practices

Building Report Card (BRC) and Commitment Sheet – Building which is committing to all DOER Targets (No modeling required)

Building and Usage: _____

Conditioned Space (sf): _____

		Code	Commitment	DOER Target
Populate applicable row(s) per italics	*For office and schools* - Heating thermal energy demand intensity (TEDI) (kBtu/sf-yr)	No code value		From Appendix A
	For office and schools - Cooling thermal energy demand intensity (TEDI) (kBtu/sf-yr)	No code value		From Appendix A
	For residential >= 6 dwelling units - Passivehouse (Y/N)	No code value		From Appendix A
	For residential < 6 dwelling units - HERS (0-100)	From Code		From Appendix A
	All other buildings - Percent improvement over Code (% improved EUI)	0%		From Appendix A
Populate only rows that have a value in DOER Target value in Appendix A	Vertical UA (Btu/hr-F)	From Code		From Appendix A
	Roof R value (ft^2-°F-h/BTU)	From Code		From Appendix A
	Air infiltration (cfm/sf at 75 Pa), confirmed with field testing	From Code		From Appendix A
	Economizer	From Code		From Appendix A
	Ventilation Energy Recovery Effectiveness (%)	From Code		From Appendix A
	Total annual space heating by electric air or ground source (%)	No code value		From Appendix A
	Fossil fuel-sourced space heating energy use, normalized (kBtu/sf-yr)	No code value		From Appendix A
	Total annual water heating by electric air or ground source (%)	No code value		From Appendix A
	Rooftop PV readiness (% of total roof area)	From Code		From Appendix A
	Rooftop PV installed (% of total roof area)	From Code		From Appendix A
	EV readiness (% of parking spaces)	From Code		From Appendix A
	EV level 1 charging (% of parking spaces)	From Code		From Appendix A
	EV level 2 charging (% of parking spaces)	From Code		From Appendix A
	Energy Storage (not sure units)	From Code		From Appendix A

This standardized report documents mitigation commitments that align with building code requirements and MEPA best practices (shown in a separate Appendix A). *No energy modeling is required to complete this sheet.*

Appendix: Sample Building Report for Projects Not Committing to MEPA Best Practices

	Code	Commitment	DOER Target
Heating thermal energy demand intensity (TEDI) (kBtu/sf-yr) *Do not populate if residential 6 units or less*	From Code Model	From Commitment Model	From DOER Target model
Cooling thermal energy demand intensity (TEDI) (kBtu/sf-yr) *Do not populate if residential 6 units or less*	From Code Model	From Commitment Model	From DOER Target model
HERS rating *populate for residential 4 stories or less located in Stretch Code community AND for all residential 6 units or less*	From Code Model	From Commitment Model	From DOER Target model
Building emissions rate in 2050 (tons/year)	From Code Model	From Commitment Model	From DOER Target model
Fossil fuel emissions rate in 2050 (tons/year)	From Code Model	From Commitment Model	From DOER Target model
Space heating emissions rate in 2050 (tons/year)	From Code Model	From Commitment Model	From DOER Target model
Water heating emissions rate in 2050 (tons/year)	From Code Model	From Commitment Model	From DOER Target model
30 year operating Cost ($)	From Code Model	From Commitment Model	From DOER Target model
Peak Heating (MBtu/hr)	From Code Model	From Commitment Model	From DOER Target model
Peak Cooling (MBtu/hr)	From Code Model	From Commitment Model	From DOER Target model

For projects not committing to MEPA best practices, the proponent would complete this sheet, which compares the anticipated energy performance of the new building to building code requirements and MEPA best practices. *This sheet must be completed based on energy modeling, and would accompany the prior sheet.*

MEPA GHG Emissions Policy

Land Alteration

MA Decarbonization 2050 Roadmap

Land Sector Report (*https://www.mass.gov/info-details/ma-decarbonization-roadmap*)

- 2020 estimate of 103 Tg C of forest carbon (114 MT CO_2 per acre) (84% of total landscape carbon)
- 2050 estimate of 150 Tg C of forest carbon (166 MT CO_2 per acre)

Healthy Soils Report (*forthcoming*)

- 2020 estimate of 198 MT CO_2 per acre of MA soil carbon stock

Ongoing Data Analysis

- EEA to develop annual inventory of carbon stocks by major forest type

Clean Energy & Climate Plan for 2025 and 2030

Natural and Working Lands (*https://www.mass.gov/info-details/massachusetts-clean-energy-and-climate-plan-for-2025-and-2030*)

Key Elements of Policy Portfolio

- Propose to MEPA Advisory Board that development projects clearing forest must undergo MEPA environmental impact review
- Streamlined permitting for proactive wetland restoration

Key Targets & Metrics

- ~63K acres of NWL (28% of MA lands and waters) permanently protected from conversion (2025)
- ~167K acres of NWL (30% of MA lands and waters) permanently protected from conversion (2030)
- At least 5,000 acres of new tree cover (2025)
- At least 16,100 acres of new tree cover (2030)

Current MEPA Review Thresholds (Land)

301 CMR 11.03(1)

(a) Mandatory EIR

1. Direct alteration of 50 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices.

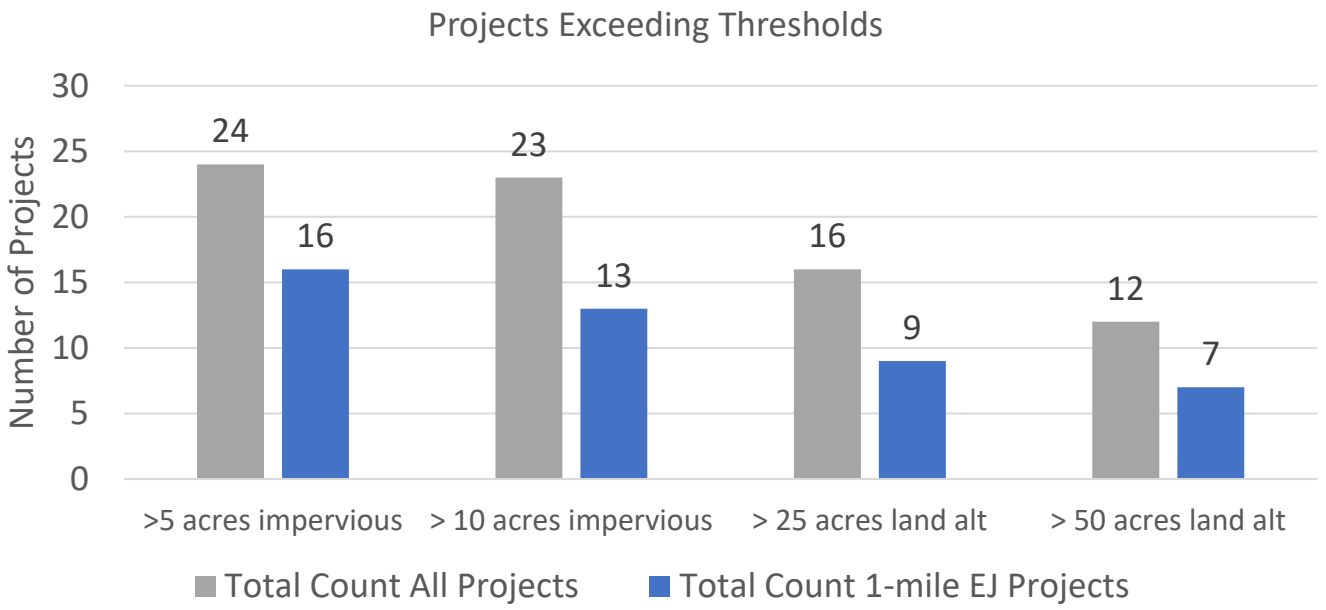
2. Creation of ten or more acres of impervious area.

(b) ENF threshold

1. Direct alteration of 25 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices.

2. Creation of five or more acres of impervious area.

MEPA Project Data: Land Thresholds

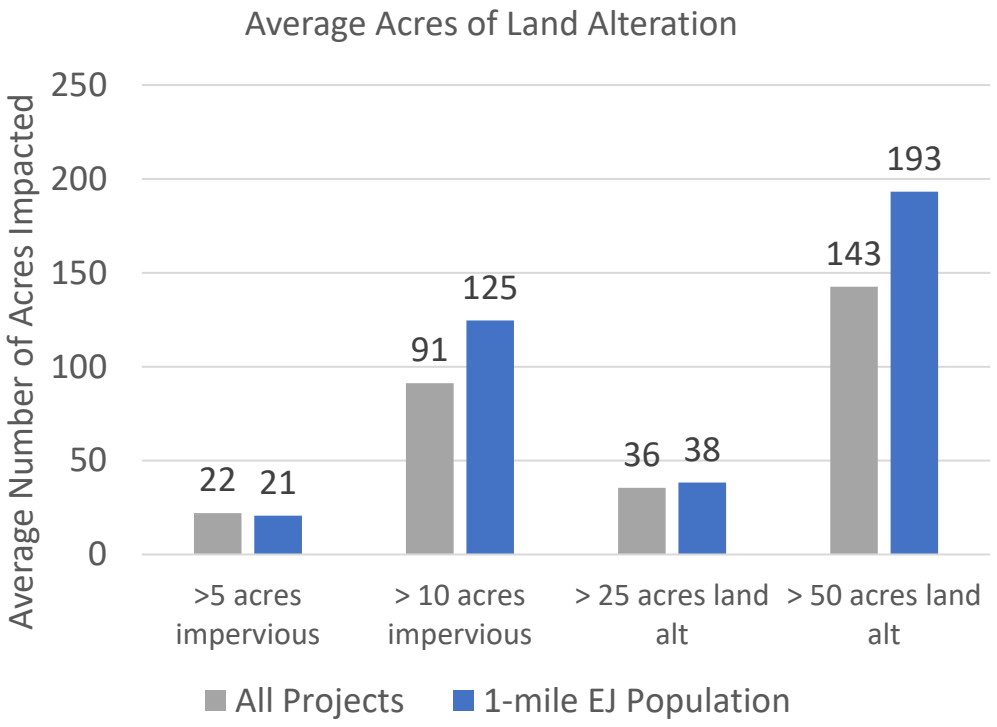


Number of Projects (thru Apr. 2022)				
	>5 acres impervious	> 10 acres impervious	> 25 acres land alt	> 50 acres land alt
2021	16	11	10	6
2022	8	12	6	6
TOTAL	24	23	16	12

Projects with EJ Populations wi 1 Mile (thru Apr. 2022)				
	>5 acres impervious	> 10 acres impervious	> 25 acres land alt	> 50 acres land alt
2021	11	5	4	2
2022	5	8	5	5
TOTAL	16	13	9	7

	Total # projects	Total # projects with 1-mile EJ
1/1/21 – 4/22/22 certs issued	**338**	**184**

MEPA Project Data: Extent of Land Alteration



Data Subset for Land Alteration Averages 2021- April 2022		
	All projects	**1-mile EJ projects**
Threshold	Number of Projects	**Number of Projects**
>5 acres impervious	17 of 24	12 of 16
> 10 acres impervious	20 of 23	12 of 13
> 25 acres land alteration	16 of 16	9 of 9
> 50 acres land alteration	12 of 12	7 of 7

MEPA GHG Emissions Policy: Potential Updates

Land Alteration

1. Reduce acreage at which carbon analysis is required for EIR projects (currently 50 acres)?

2. Apply standard values for land cover types (forest, wetland, cropland, soils) or require site-specific assessment?

3. Create exemptions for ecological restoration/natural resource projects, plus others?

4. Provide mitigation options? E.g., land conservation/CRs, documented reuse of wood, tree planting, landscaping, others.

MEPA GHG Emissions Policy

Mobile Source

(MAPC)

Clean Energy & Climate Plan for 2025 and 2030

Transportation (***https://www.mass.gov/info-details/massachusetts-clean-energy-and-climate-plan-for-2025-and-2030***)

GHG Emission Sublimits

- 23.1 MMTCO2e by 2025 (24% below 1990)
- 18.7 MMTCO2e by 2030 (39% below 1990)

Key Targets & Metrics

- 200,000 passenger EVs on the road (2025); 900,000 passenger EVs (2030)
- 15,000 public, level 2 and DCFC (fast charger) EV chargers installed (2025); 75,000 installed (2030)
- 7% reduction in VMT against baseline (2030)

Potential Regulatory Revisions

Under Consideration

Additional Regulatory Revisions

Potential Concepts Under Consideration

- ***NEW* GHG emissions threshold for building sector**
  - For new residential or commercial buildings
  - E.g., 2,000 tons per year based on GHG emissions calculator
  - Potentially add to "Air" thresholds at 301 CMR 11.03(8)

- ***NEW* forest clearing threshold**
  - For any project not involving approved or generally accepted forestry, agricultural or habitat management practices
  - E.g., XX acres of "forest" clearing as shown in USGS mapping
  - Potentially add to "Land" thresholds at 301 CMR 11.03(1)

Tentative Timeline for Policy Updates

Date	Activity
June 10	Meeting of MEPA Advisory Committee to discuss MEPA GHG Emissions Policy
June-August	Technical sessions on GHG and climate resiliency policies; continue informal stakeholder meetings
August/Early September	Reconvene MEPA Advisory Committee
Fall 2022	Issue policy updates for formal comment
Late 2022	Issue final policies with 1/1/23 effective date