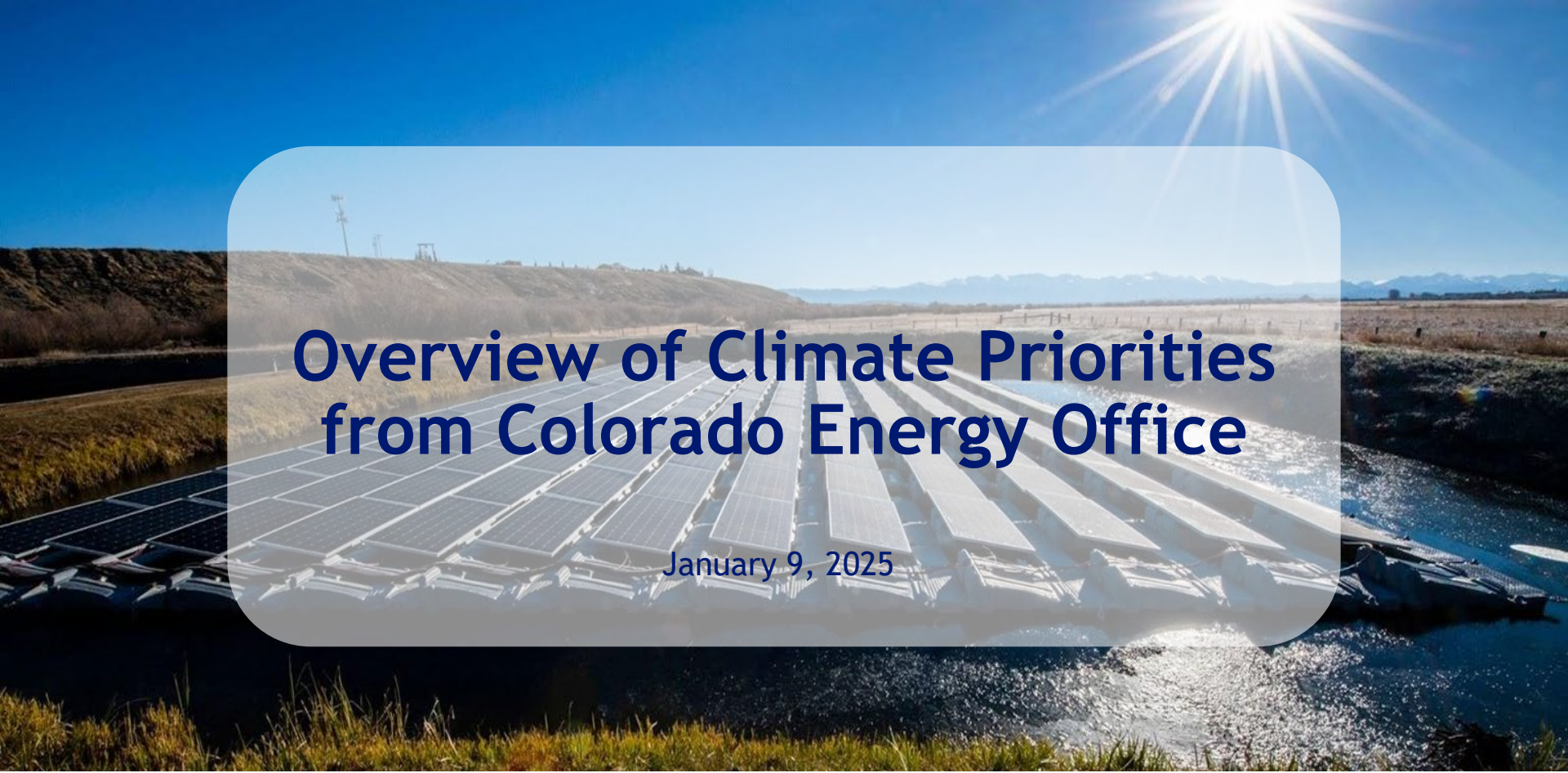


Overview of Climate Priorities from Colorado Energy Office

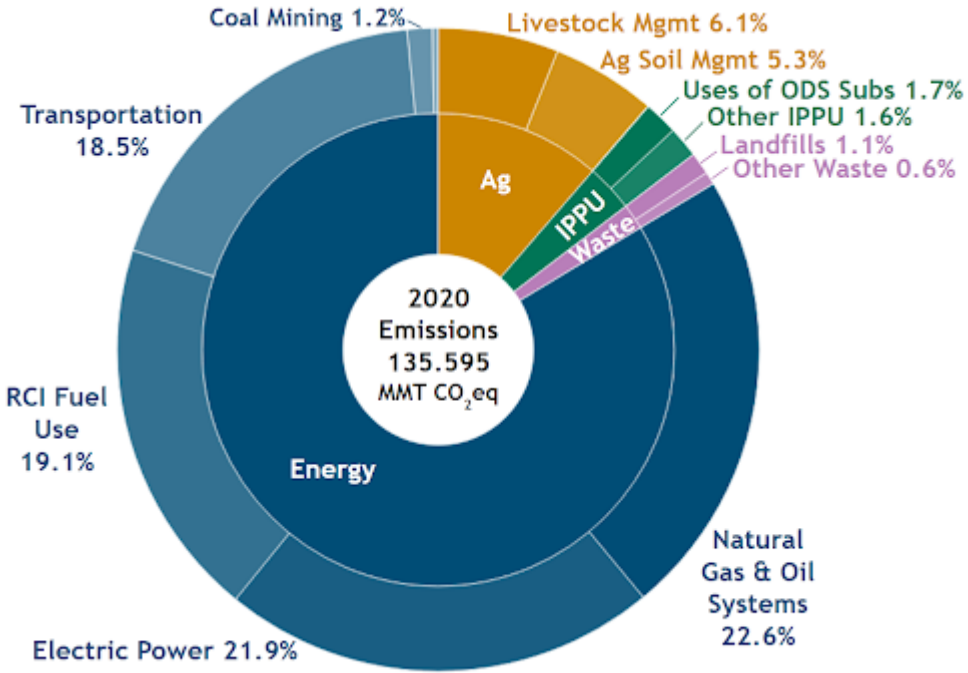
January 9, 2025

Statewide Goals set by Legislature

In 2019, the CO Legislature passed HB19-1261 which created science-based targets for reducing greenhouse gas pollution, later updated in SB23-16. Our current reduction targets (below 2005 levels) are:

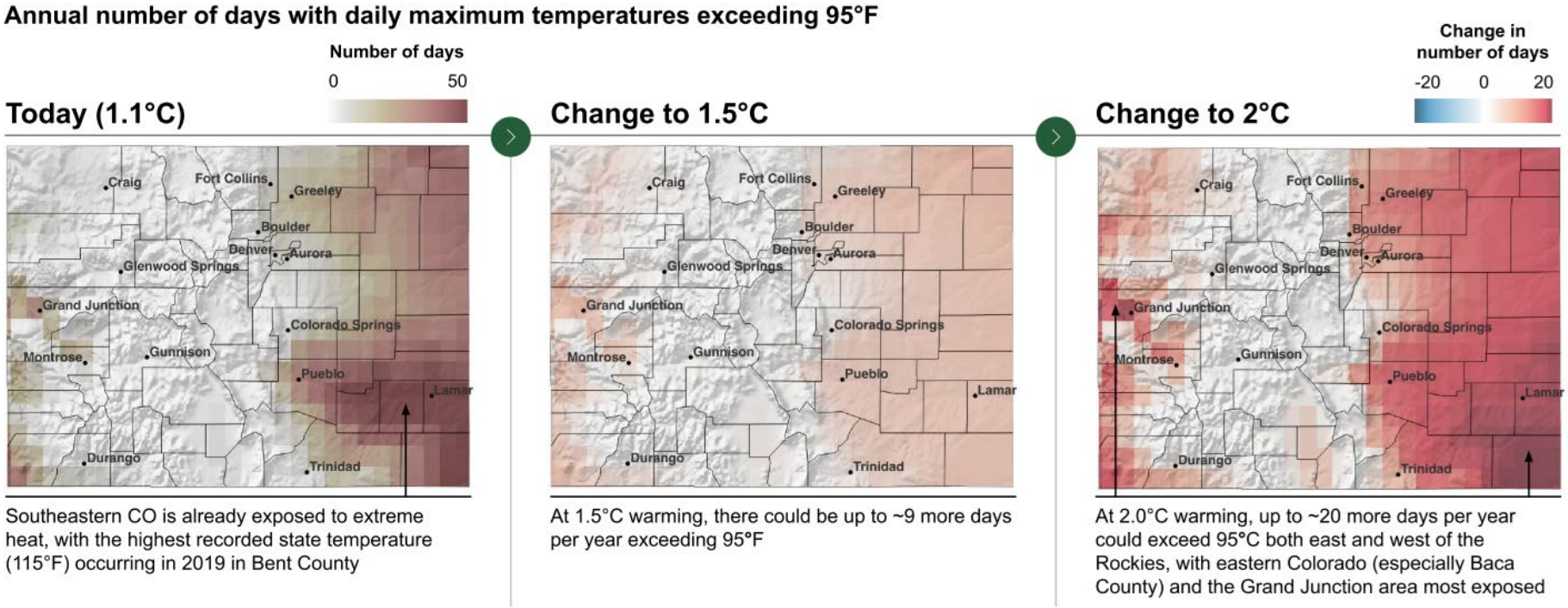
- **26% by 2025**
- **50% by 2030**
- **65% by 2035**
- **75% by 2040**
- **90% by 2045**
- **Net Zero by 2050**

Sources of Emissions



2020 Inventory

Impact of Climate Change on Colorado



Source: NASA-NEX GDDP CMIP6 ensemble, Colorado Climate Preparedness Roadmap, June 2023

Example natural systems impacts (not exhaustive)

	Forests	Agriculture	Biodiversity
Heat	Increased invasive species and insect outbreaks from high temps; reduction of streamflow	Reduction in crop yield from heat and drought; potential for increased use of pesticides harming ecosystem and human health; heat stress to livestock	Reduced streamflow, impacting species migration and reproduction; increased risk of species extinction
Flooding	Increased soil erosion, releasing carbon into atmosphere; root system damage; tree suffocation from depleted oxygen	Increased agricultural runoff, diminishing water quality; depletion of soil nutrients	Increased risk of species extinction; habitat destruction; easy transmission of diseases from muddy fields
Wildfires	Large swaths of forests burnt, releasing carbon into atmosphere; increased erosion and burn scars; varying forest recovery rates taking multiple years	Reduction in soil fertility; air pollution from smoke harming livestock health	Long term or permanent loss of native vegetation and wildlife habitats

Ecosystem losses from climate hazards will most likely reach new extremes if no actions are taken to improve resilience and adapt. The IPCC estimates >20% of all species will become endangered at 2.1°C of warming.

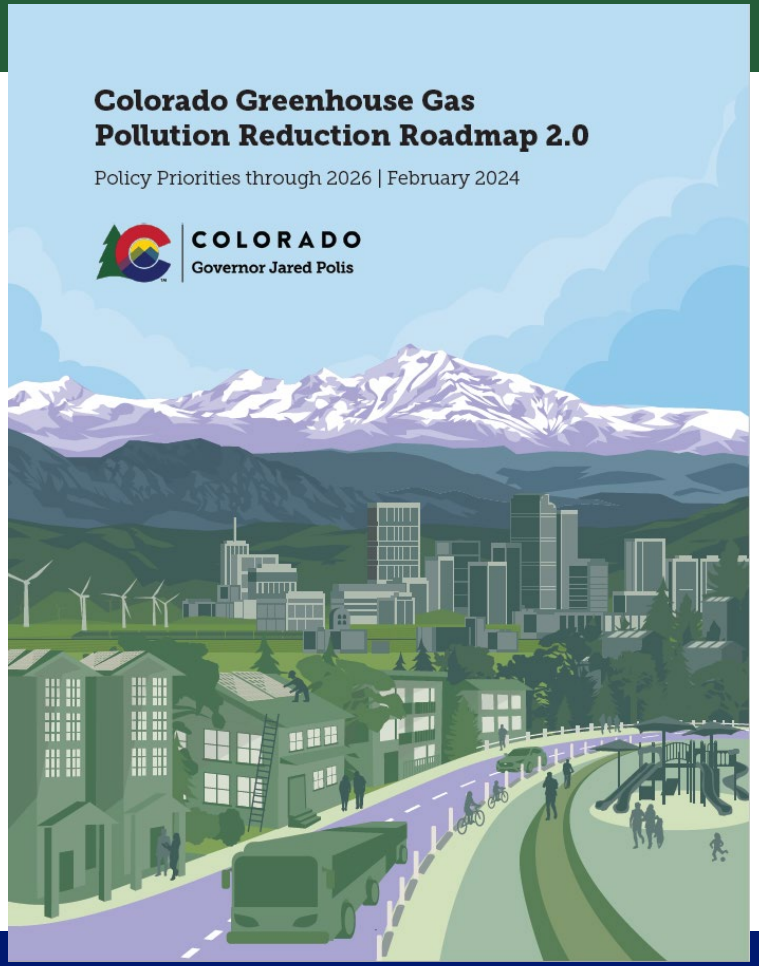
Source: IPCC, AR6, WGII, (55), Colorado Climate Preparedness Roadmap, June 2023

How is Colorado meeting its Climate Goals?

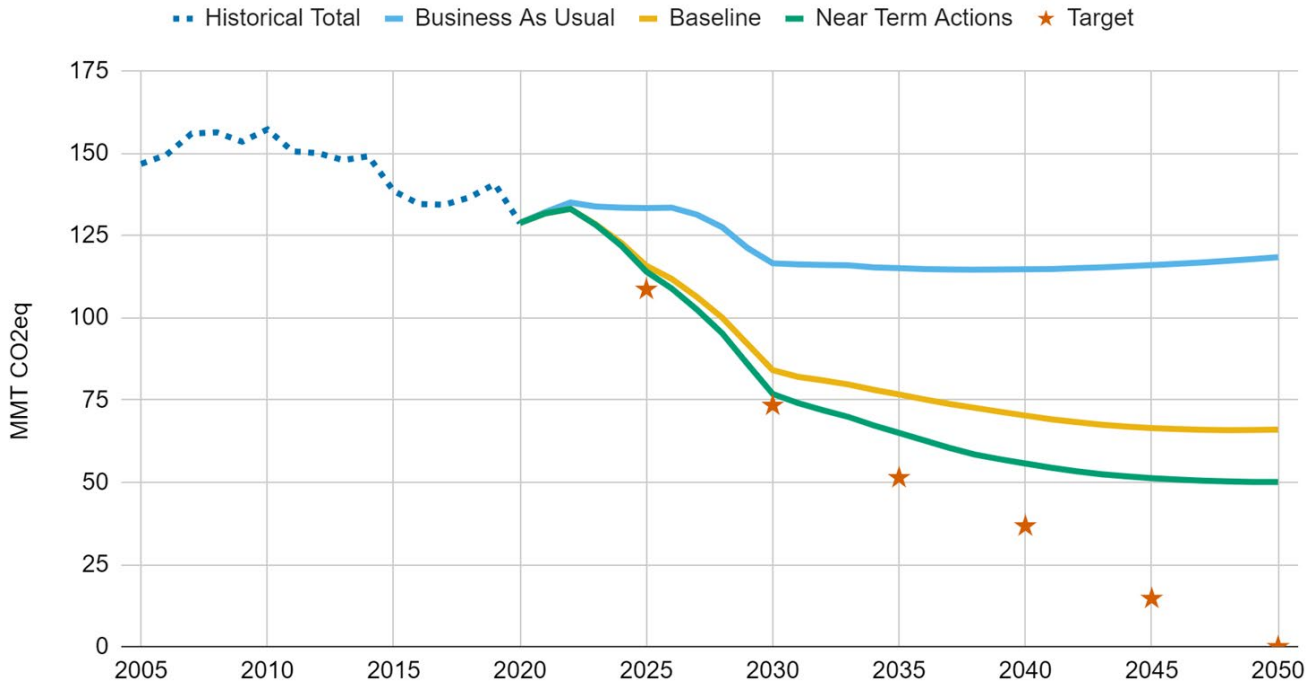
- Transition the electricity grid to clean sources of energy (mostly wind and solar) while ensuring affordability and reliability
  - Make investments to support the growth of geothermal energy and other clean, firm sources of energy, additional transmission, distribution and storage
- Electrify transportation, buildings, industry
- Support smart land use and housing growth and invest in transit
- Adopt nation-leading oil and gas regulation
- Lay the foundation for effective carbon management technologies, reductions in emissions from natural/working lands

GHG Roadmap 2.0

- Released February 26, 2024
- Laid out 49 Near Term Actions the State is committed to undertaking through 2026
- Updated emissions forecast based on actions to date and additional state committments
- Will publicly track implementation of the Near Term Actions on the Governor's Dashboard



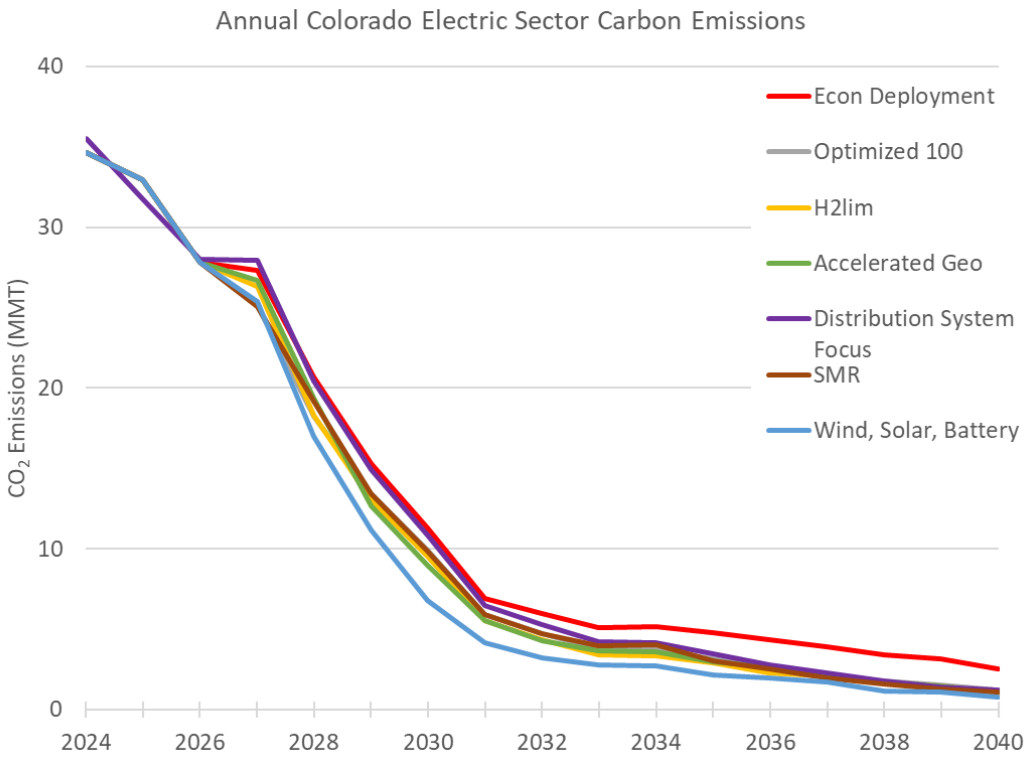
Emissions Trajectory following Roadmap 2.0



Roadmap Direction to DNR

- Greenhouse Gas Pollution Reduction Roadmap directed DNR and State Land Board to Expand Renewable Energy Development and Transmission on State Lands, specifically:
- “As of summer 2023, solar and wind energy projects located on state trust land generated more than 500 MWs of energy, representing approximately 10 percent of the total renewable energy produced in Colorado. The Colorado State Land Board will aspire to increase clean energy generated from state lands to 750 MWs by 2028.”

Additional Renewables Needed to Reach 2040 Goals



- CEO 2040 Study modeling shows can reach 94% reduction in GHG emissions from electricity sector by 2040 at no incremental cost.
- This scenario entails additions of 5.5 GW wind, **11 GW solar**, and 9 GW storage, compared to 2022 levels of 5 GW wind, **2 GW solar**, and 0.5 GW of storage.

Land Use for Solar in Colorado to Meet 2040 Goal

- NREL estimates a national array-density at approximate 6.3 acres/MW for large scale solar development (*Land-Use Requirements for Solar Power Plants in the United States, Technical Report, National Renewable Energy Laboratory, 2013*)
- CEO 2040 Study model requires 11 additional GW solar by 2040 in addition to 2 GW currently installed (*Pathways to Deep Decarbonization in Colorado's Electric Sector by 2040, Colorado Energy Office & Ascend Analytics, 2024*)
- 6.3 acres/MW x 11GW= 69,000 additional acres for solar by 2040
- **6.3 acres/MW x 13GW= 82,000 total acres for solar by 2040**

Solar Land Use in Context

- Additional solar needed to meet goals will require estimated 69,000 acres of new solar (82,000 total) by 2040

State of Colorado	66,000,000 acres
US Forest Service lands	11,300,000 acres
Federal BLM lands	8,300,000 acres
State Land Board land	2,800,000 acres
Total Acres for Solar Development (2040)[1]	82,000 acres

(1) National Renewable Energy Laboratory, Colorado Energy Office/Ascend Analytics

Solar Land Use in Context

- The overall land area likely needed for solar development in Colorado is significantly lower than land area likely to be developed for urban development and low-density residential use
  - 417,500 acres likely to be lost to urban development and low-density residential use by 2040[1]
  - 82,000 acres total needed for solar (including both developed and undeveloped lands)

(1) American Farmland Trust, Potential Placement of Utility-scale Solar installations on Agricultural Lands in the US to 2040, Farms under Threat 2040

Solar Land Use in Context

- Department Of Energy Solar Futures Study (2021) puts nationwide maximum acreage needed for solar to meet 2050 goals in context:

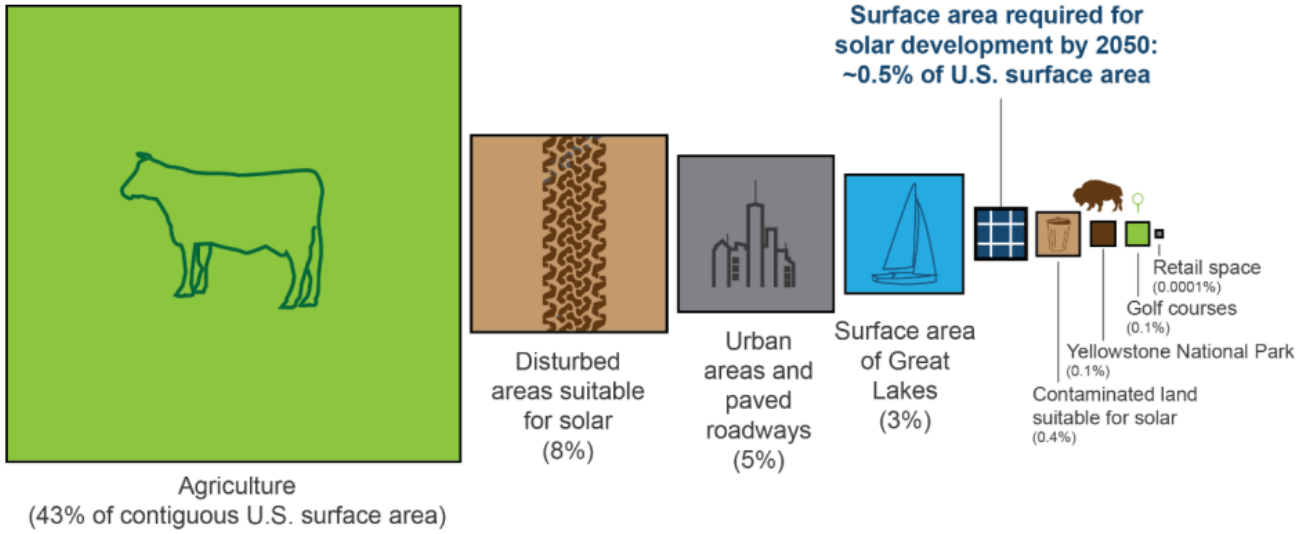


Figure 8 - 7. Maximum land use required for solar in 2050 in the *Solar Futures* scenarios compared with solar-suitable disturbed and contaminated areas and examples of other U.S. areas

Status of SB24-212

- SB 24-212 provides resources to Tribes and local governments to assess, site and permit utility-scale renewable energy projects while considering community values, including impacts to lands and wildlife.
- Directs the Colorado Energy and Carbon Management Commission (ECMC) to provide technical support for Tribes and local governments updating their land use codes and assessing individual projects
- CEO, with assistance from DNR, will submit a report (Siting Study) to the General Assembly by September 30, 2025 that will:
    - evaluate and assess existing local government processes for the siting of commercially viable renewable energy projects and commercial energy transmission facilities,
    - evaluate the impact of renewable energy projects and commercial energy transmission facilities on wildlife resources and the use of wildlife mitigation, and
    - review decommissioning policies and best practices for community benefit agreements, as well as analyze the the range of fees imposed by local governments.

Status of 212

- In preparing the report, CEO will provide opportunities for municipal and county governments; renewable energy project developers; conservation organizations; local stakeholders, including property owners; electric utilities; Tribal governments, and labor organizations to provide input and opportunities for public comment before the final report is completed.
    - Step 1: Survey questions (Survey closed Dec 6)
    - Step 2: Webinars with stakeholder groups discussing findings from surveys and answer stakeholder questions (Early January)
    - Step 3: Incorporate survey and feedback into draft report (Jan-March)
    - Step 4: Provide opportunities for comment on Draft report (March-June)
    - Step 5: Finalize report and submit to General Assembly by Sept 30, 2025 (report will be available on CEO's website)
- Stakeholders will have the option to take part in as many or as little of these opportunities as they choose.

Technical Assistance to Local Govs from CEO

- Renewable Energy Siting through Technical Engagement and Planning (R-STEP) (DOE):
  - Will provide technical assistance to local governments to support planning, siting, and permitting of utility-scale renewable energy projects in Colorado,
  - Will establish a Clean Energy Resource Hub for local governments to access resources and request technical support on planning and siting of new large-scale renewable projects, and
  - R-STEP partnership plans to hold education and outreach events throughout Colorado.
- Climate Pollution Reduction Grants (CPRG) program (EPA):
  - $60 million will go to the Local Government Climate Action accelerator (begin Summer 2025)
  - Local governments and can apply for funds to support developing policies and projects that reduce greenhouse gas emissions across four categories: Buildings; Land Use, Waste and Transportation, including renewable energy siting.


Thank You!