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Docket Number:	23-IEPR-04
Project Title:	Accelerating Bulk Grid Connection
TN #:	249974
Document Title:	Presentation - Growing the Grid - A Plan to Accelerate California's Clean Energy Transition
Description:	6.B Michael, Colvin EDF
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Organization:	Environmental Defense Fund
Submitter Role:	Public
Submission Date:	5/3/2023 1:46:51 PM
Docketed Date:	5/3/2023



Growing the Grid:

A Plan to Accelerate California's Clean Energy Transition

May 4, 2023

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California is a global leader in climate and clean energy policy

- Clean energy milestones:
 - 60% carbon-free electricity generation
 - 13 GW of rooftop solar
 - 4 GW of battery storage
- Ambitious targets include:
 - Economywide net-zero GHGs by 2045
 - Transportation, fuels, buildings...
 - Zero-carbon electricity sales: **90% by 2035**, 95% by 2040, 100% by 2045

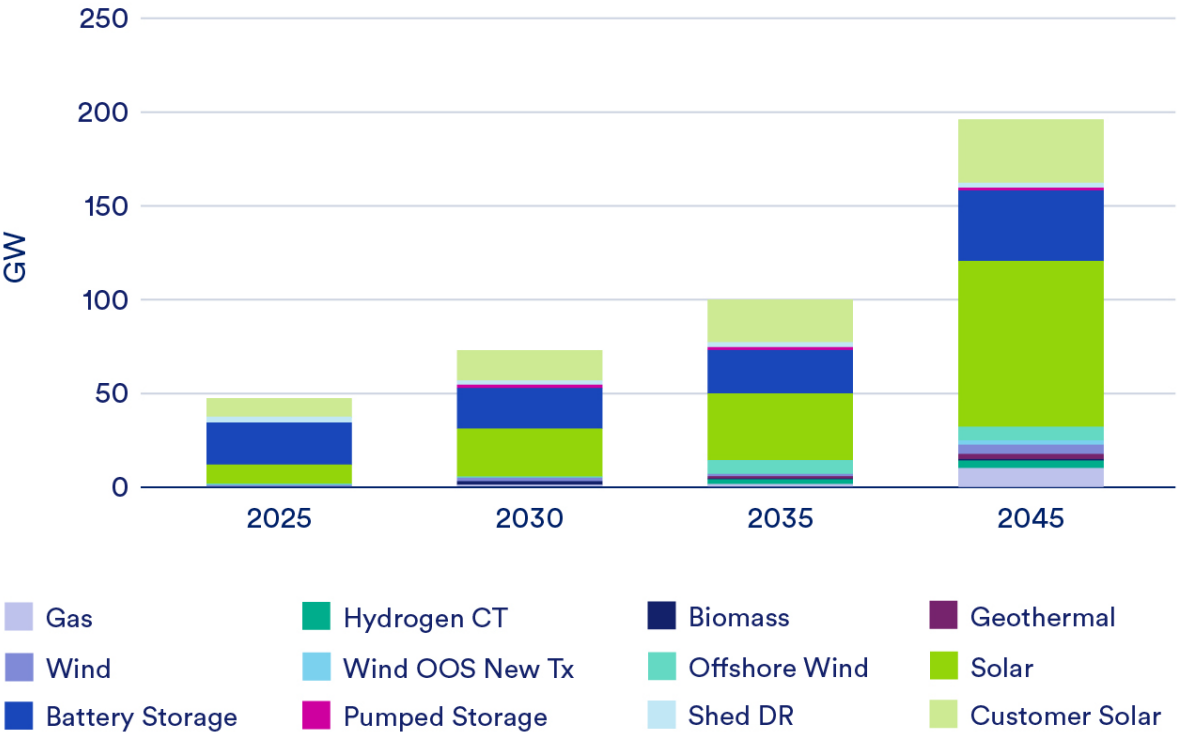
What could increase the likelihood of California meeting its ambitious climate goals?



Achieving clean energy
goals requires
unprecedented action

Meeting California's clean energy targets will require a rapid expansion of the grid

■ 3.5x growth in total generation capacity in 20 years

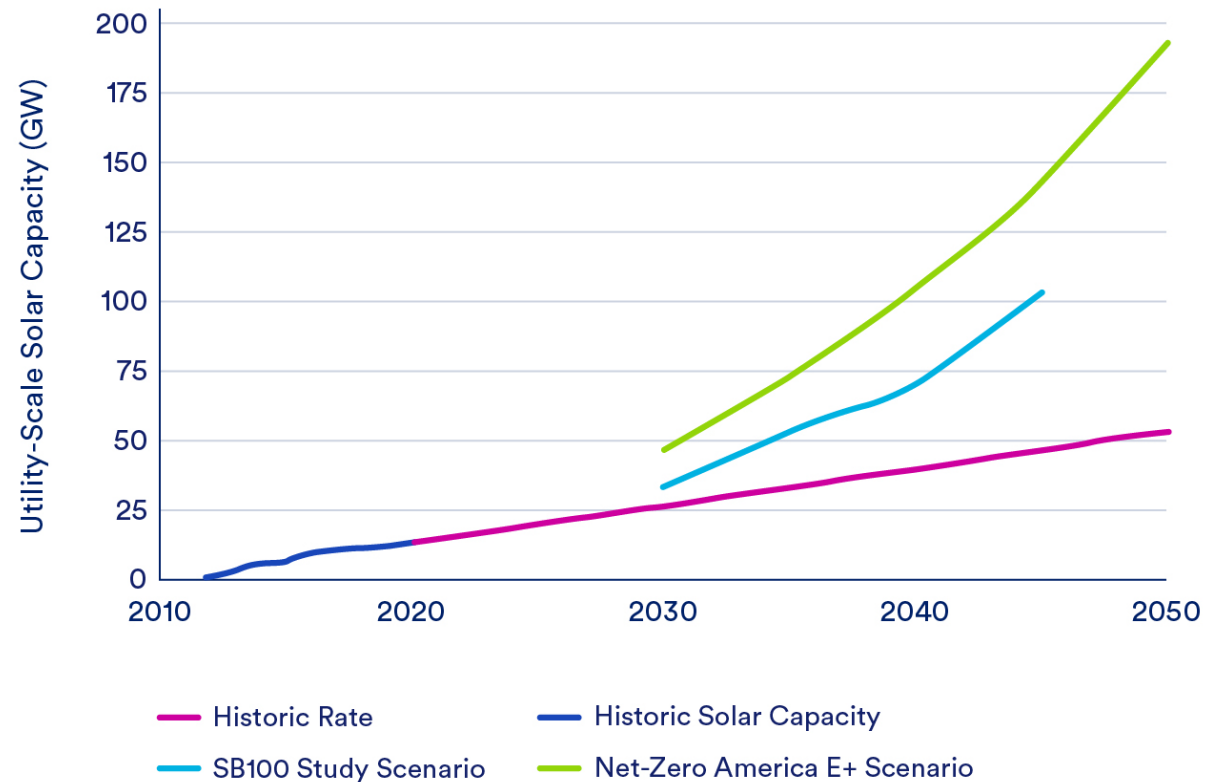


California Air Resources Board (CARB),
 "Draft 2022 Scoping Plan Update," page 162, May 10, 2022.
<https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp.pdf>

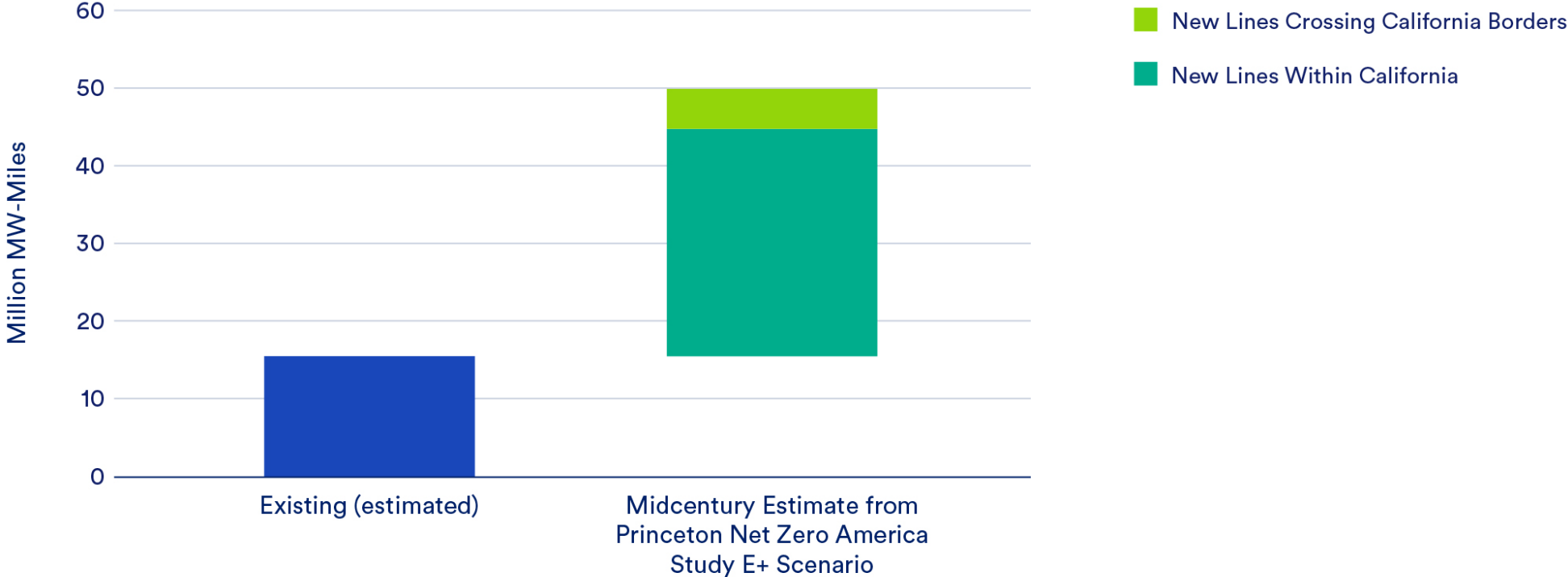


The current rate of solar expansion is far slower than required

- 90 GW new utility-scale solar and 40 GW of new battery storage by 2045
- An additional 40 GW of solar required for clean hydrogen production
- The state added 1.3 GW per year between 2015 to 2020
- The pace would have to increase by 5x

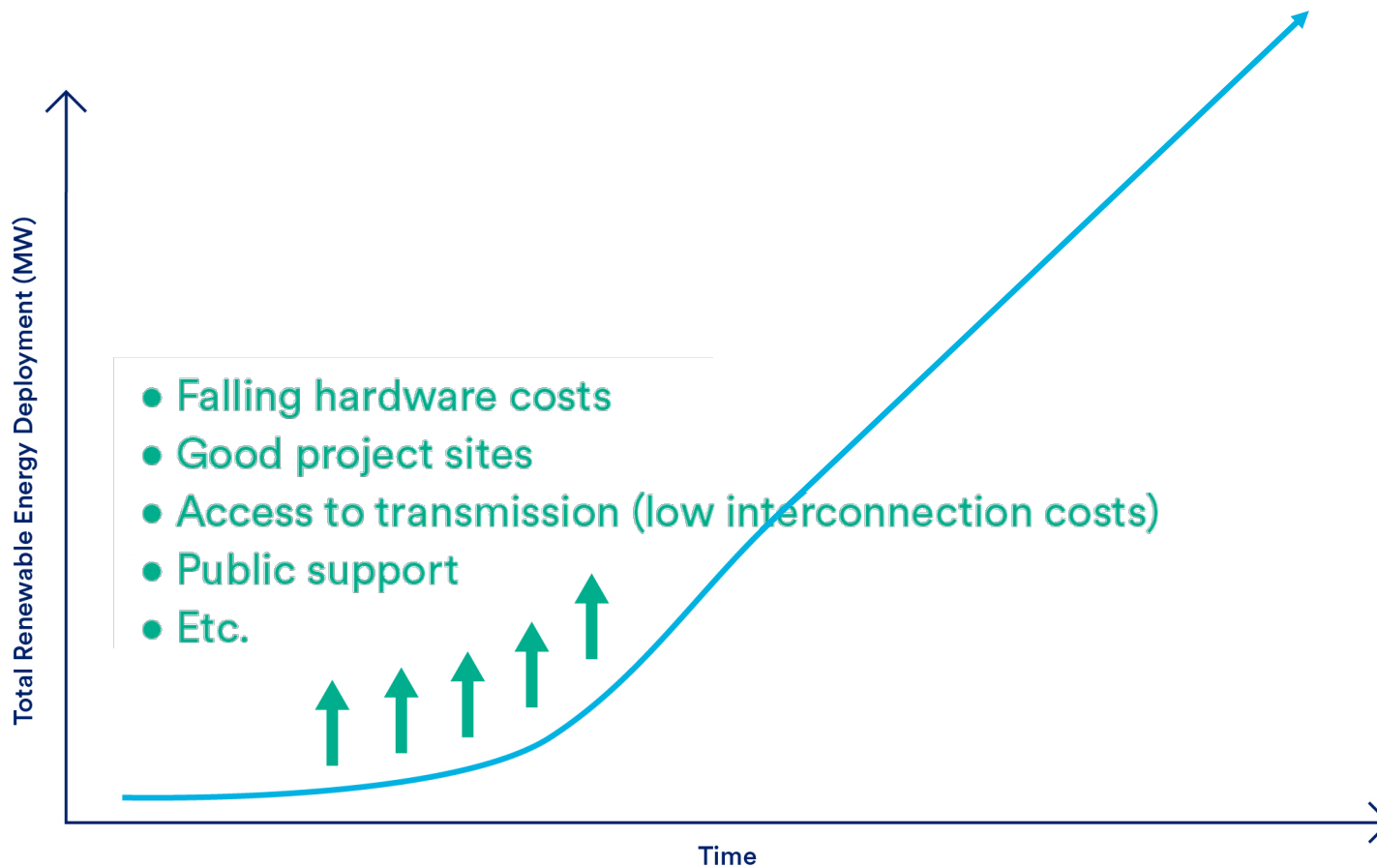


Transmission capacity may need to triple



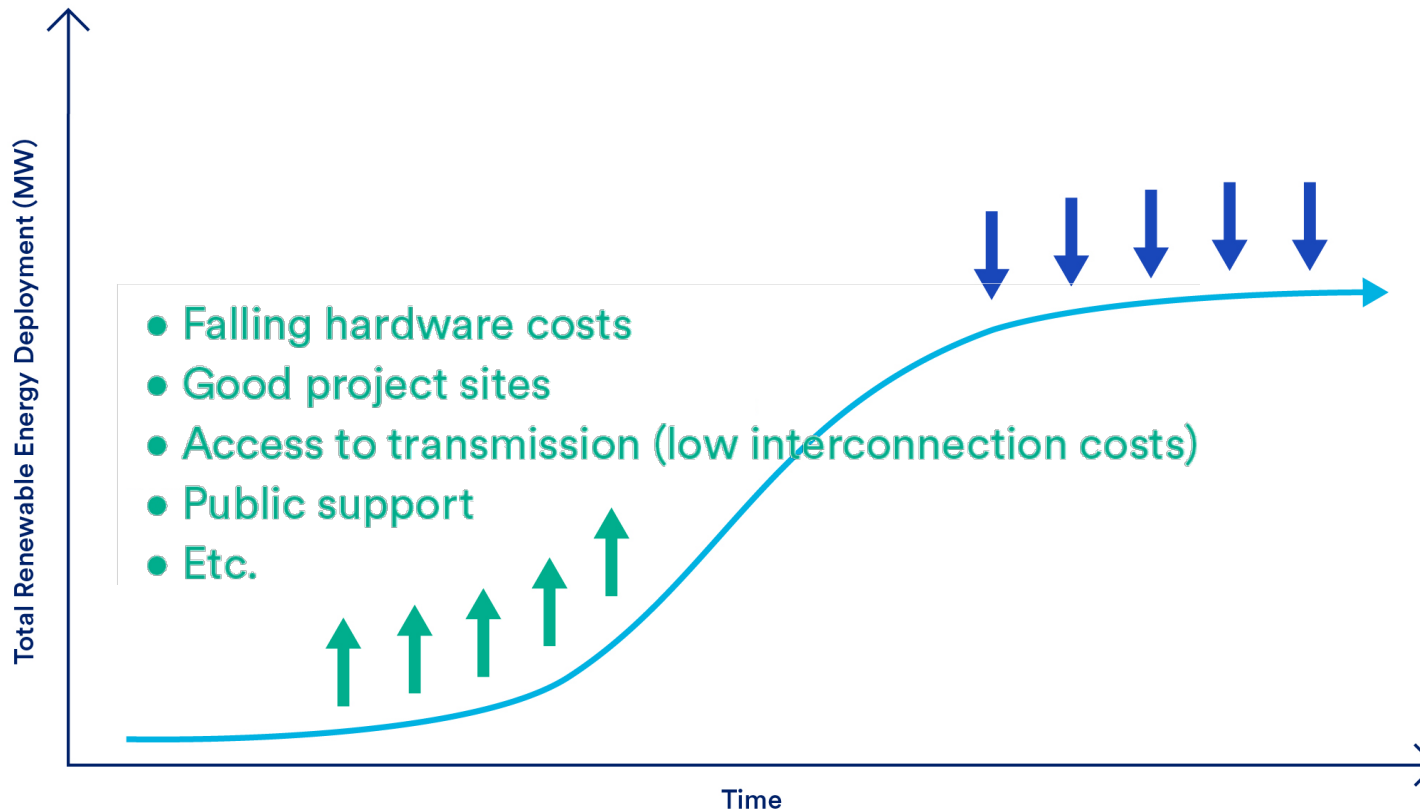
Headwinds to
deployment are likely
to increase

The real-world obstacles to clean energy deployment will likely grow if left unaddressed



Derived from: Cherp et al, "National growth dynamics of wind and solar power compared to the growth required for global climate targets," Nature Energy, Vol 6, July 2021.

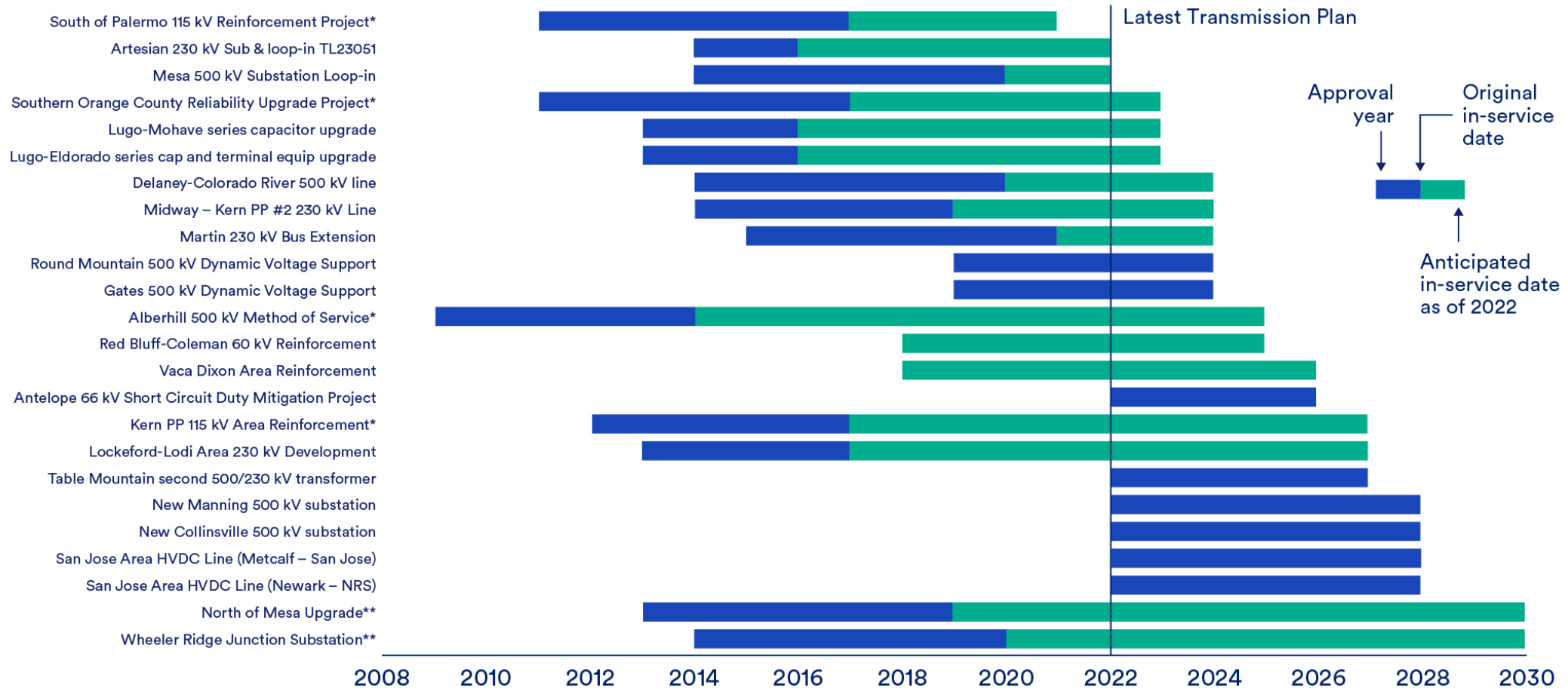
The real-world obstacles to clean energy deployment will likely grow if left unaddressed



- Increasing land costs & competing needs
- Fewer amendable landowners
- Further from transmission
- Lower capacity factors/poorer resource
- Public opposition
- Diminishing available transmission capacity
- Etc.

Derived from: Cherp et al, "National growth dynamics of wind and solar power compared to the growth required for global climate targets," Nature Energy, Vol 6, July 2021.

Transmission development often takes longer than anticipated



* Approval years and Original in-service date for projects approved prior to 2012 were taken from the 2011-2012 Transmission Plan, the oldest available on the California ISO's website.

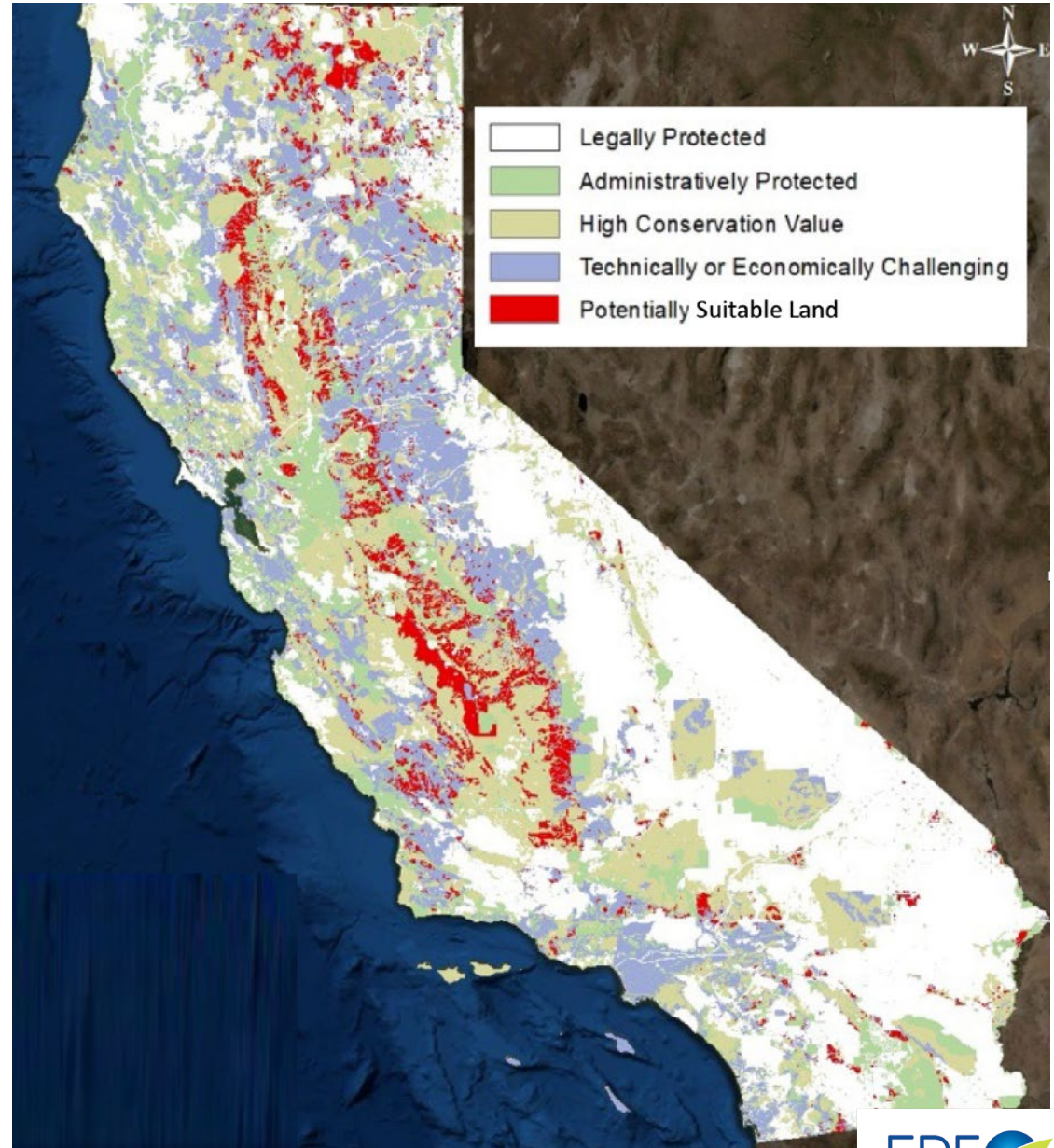
** As of the 2021-2022 Transmission Plan, these projects were listed as "on hold" with no definite completion date.

Using scarce land for clean energy development means navigating land use tradeoffs

- 5 million acres potentially suitable for utility-scale solar siting in California
- 10% of that would be needed to achieve the goals of SB 100

This map was constructed using data from The Nature Conservancy's Power of Place study (2019). Potentially suitable land considers ecological, social, and techno-economic criteria. TNC also emphasizes the need for further site-specific environmental, social, and economic impact assessment for individual projects.

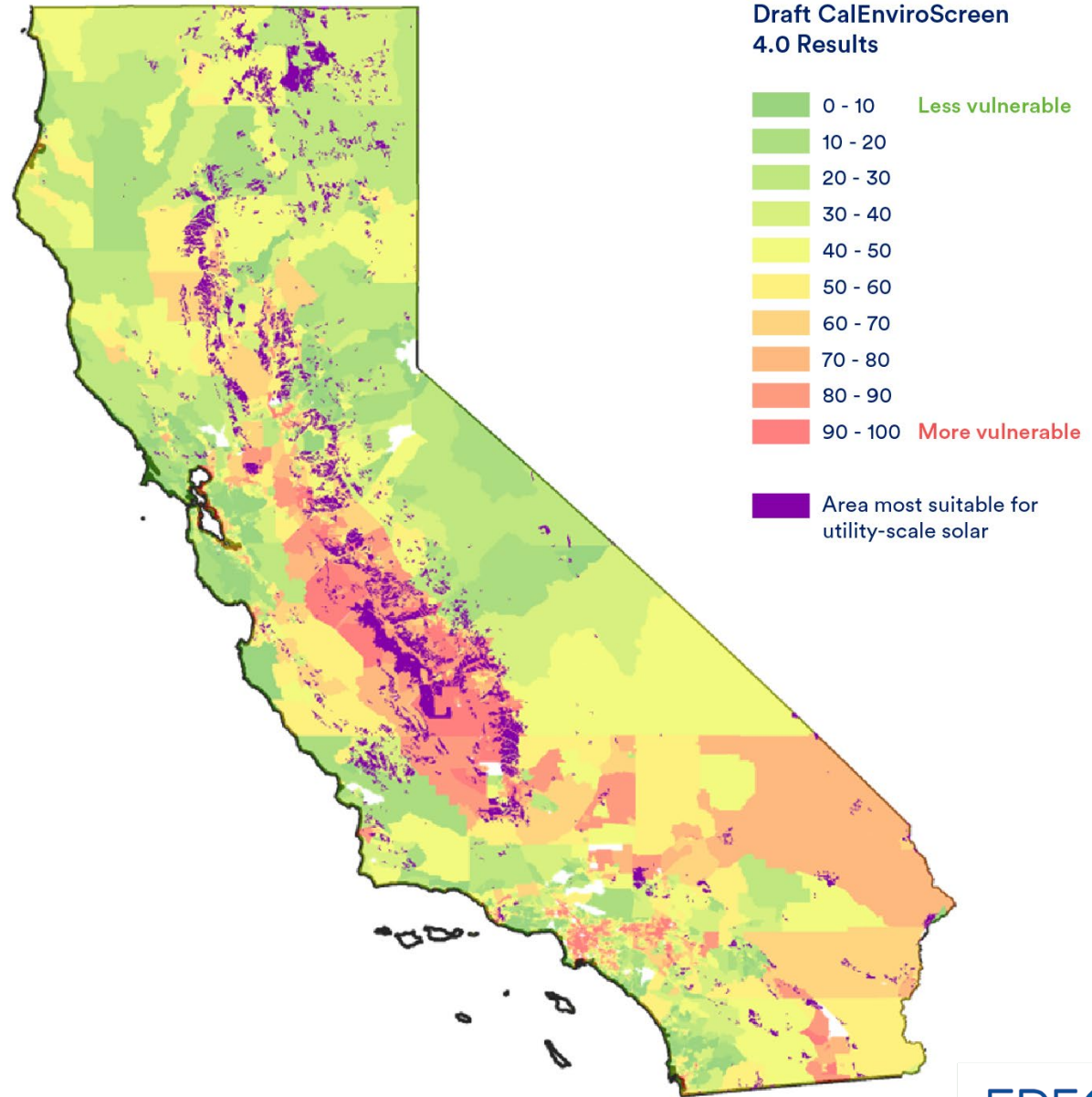
Source: *The Nature Conservancy's Power of Place study (2019)*



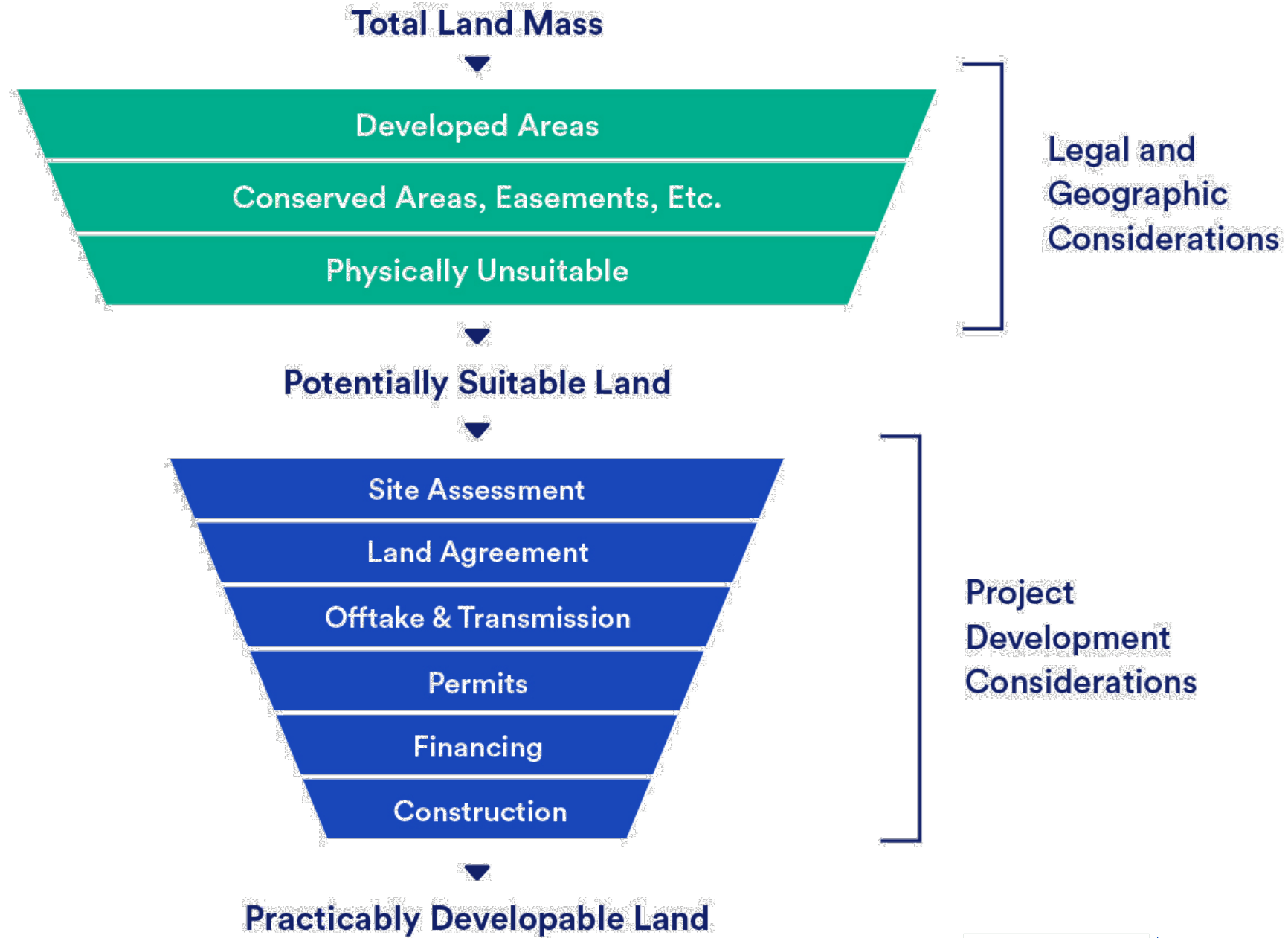
Potentially suitable land overlaps with vulnerable populations

Vulnerable communities are considered disproportionately burdened by multiple sources of pollution and other vulnerabilities.

Source: *The Nature Conservancy's Power of Place study (2019)*



Not all potentially suitable land for clean energy is practicably developable land

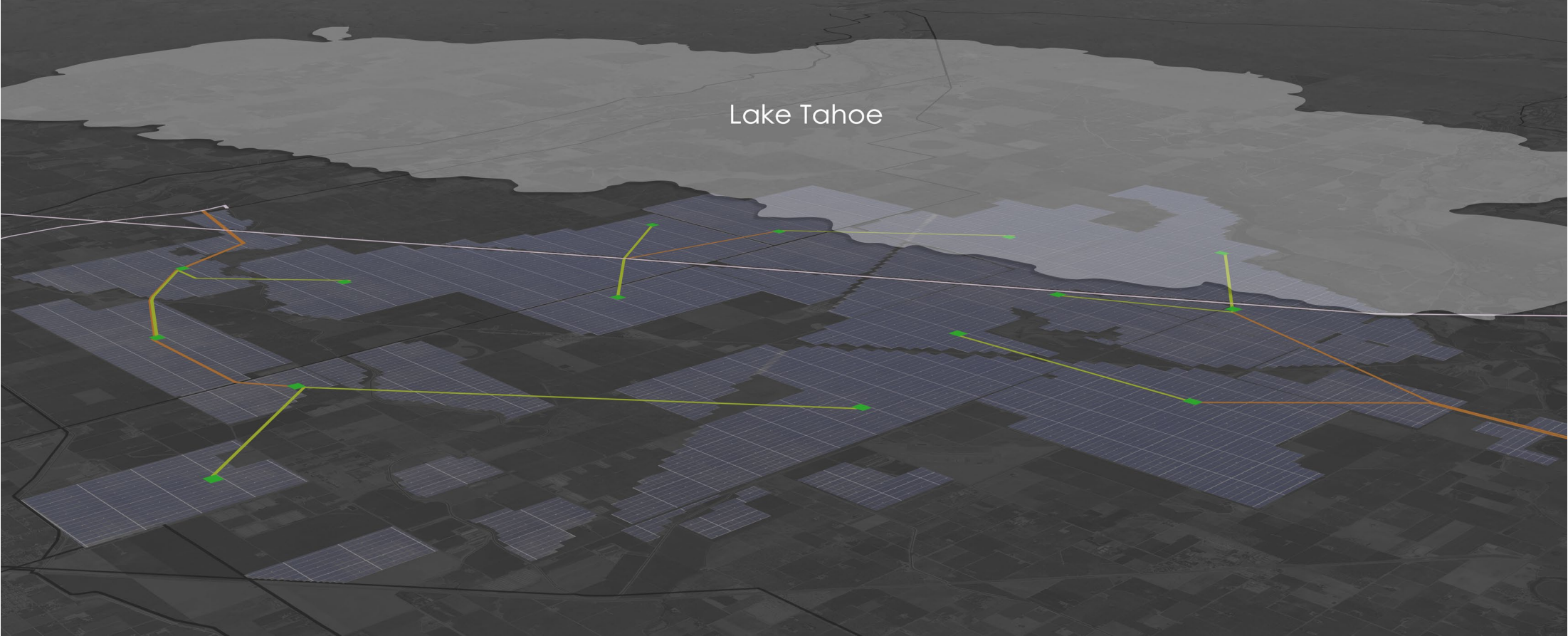


The clean energy transition will require an astonishing amount of land



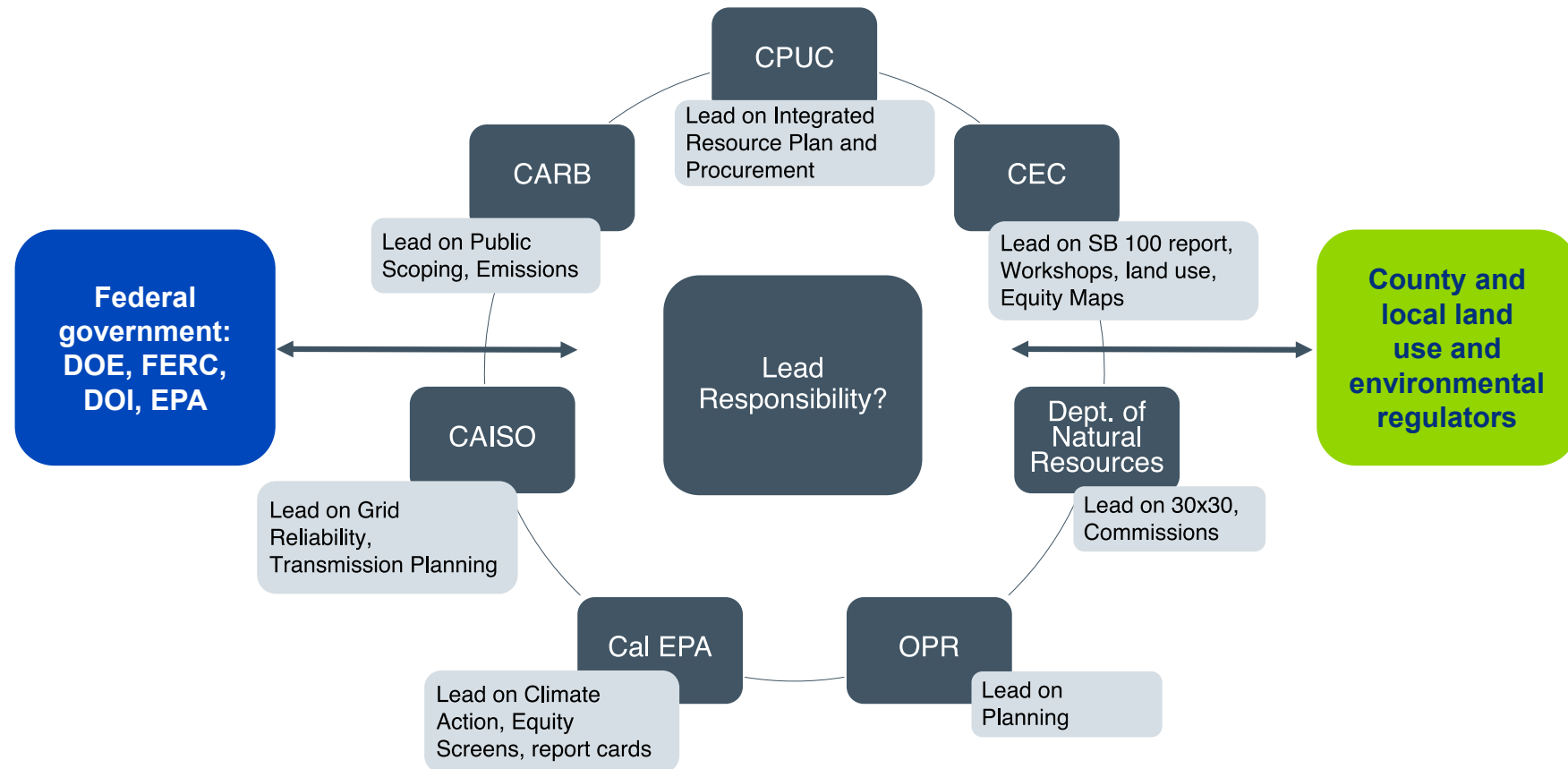
CATF-commissioned visual simulation of a 6-Gigawatt solar farm

The clean energy transition will require an astonishing amount of land



CATF-commissioned visual simulation of a 6-Gigawatt solar farm

There is no designated authority on clean energy deployment



Recommendations

The following **RECOMMENDATIONS** offer a path to accelerate California's clean energy transition

- ✓ **Develop a Clean Energy Deployment Plan** with specific quantities, locations, and timing of new resource development and infrastructure expansion.
- ✓ **Assign a lead agency** the responsibility for achieving the state's clean energy goals.
- ✓ **Develop a dashboard** to publicly track progress.
- ✓ **Advance supportive policy** for planning, permitting, financing, and building clean energy infrastructure.
- ✓ **Engage the public** by continuing and strengthening California's current public engagement efforts.

Questions?

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