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Building Decarbonization and Jobs: Innovation, Energy Efficiency, and Inclusive Economic Growth

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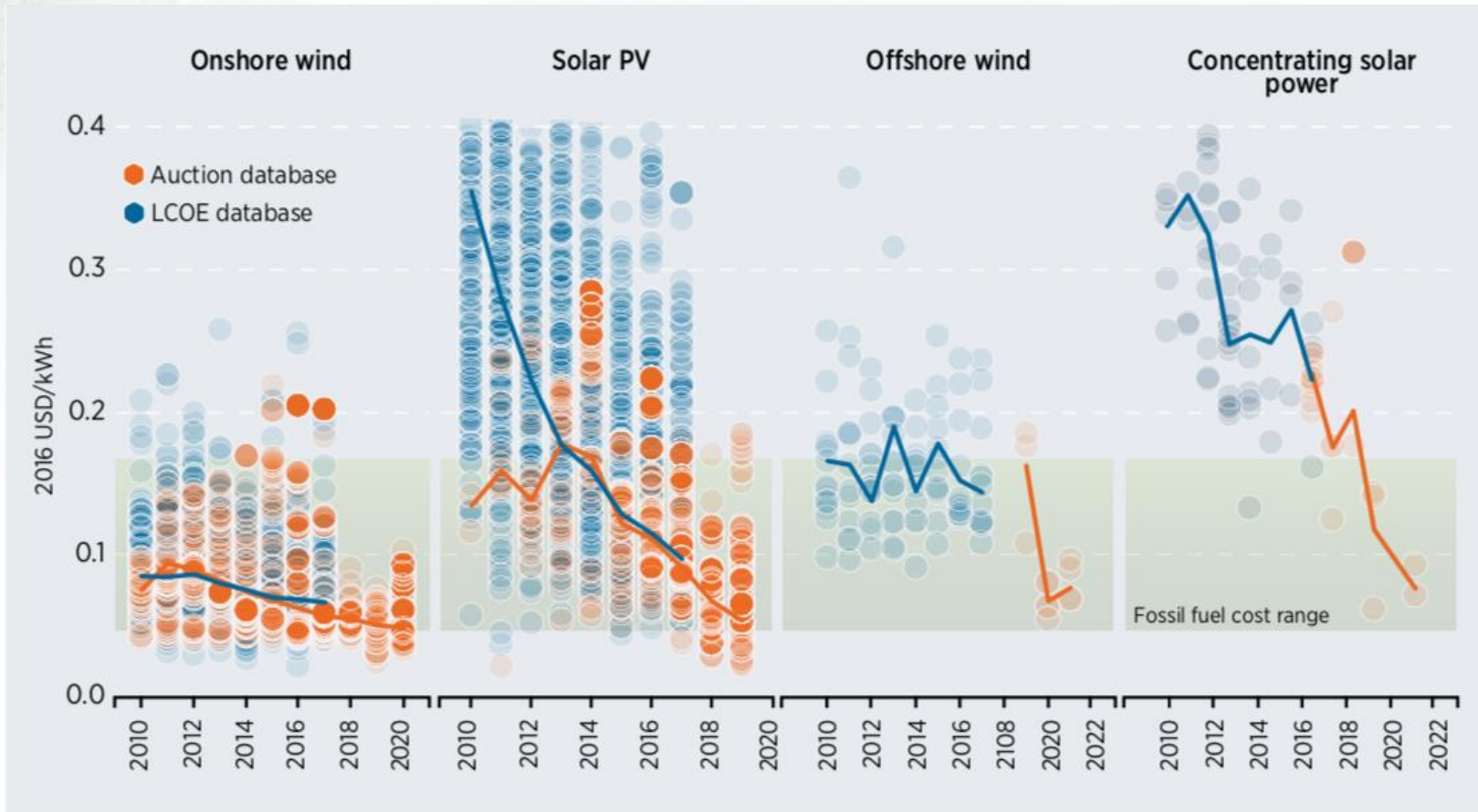
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New Energy Paradigm: Supply

- Renewable energy delivers immense promise for GHG mitigation, but
- It also presents a new paradigm for energy supply
 - Conventional (carbon) energy is an exhaustible resource, with ever-increasing cost
 - Renewable energy is a boundless resource, subject to a technology constraint

Renewable Innovations Make Energy Affordable



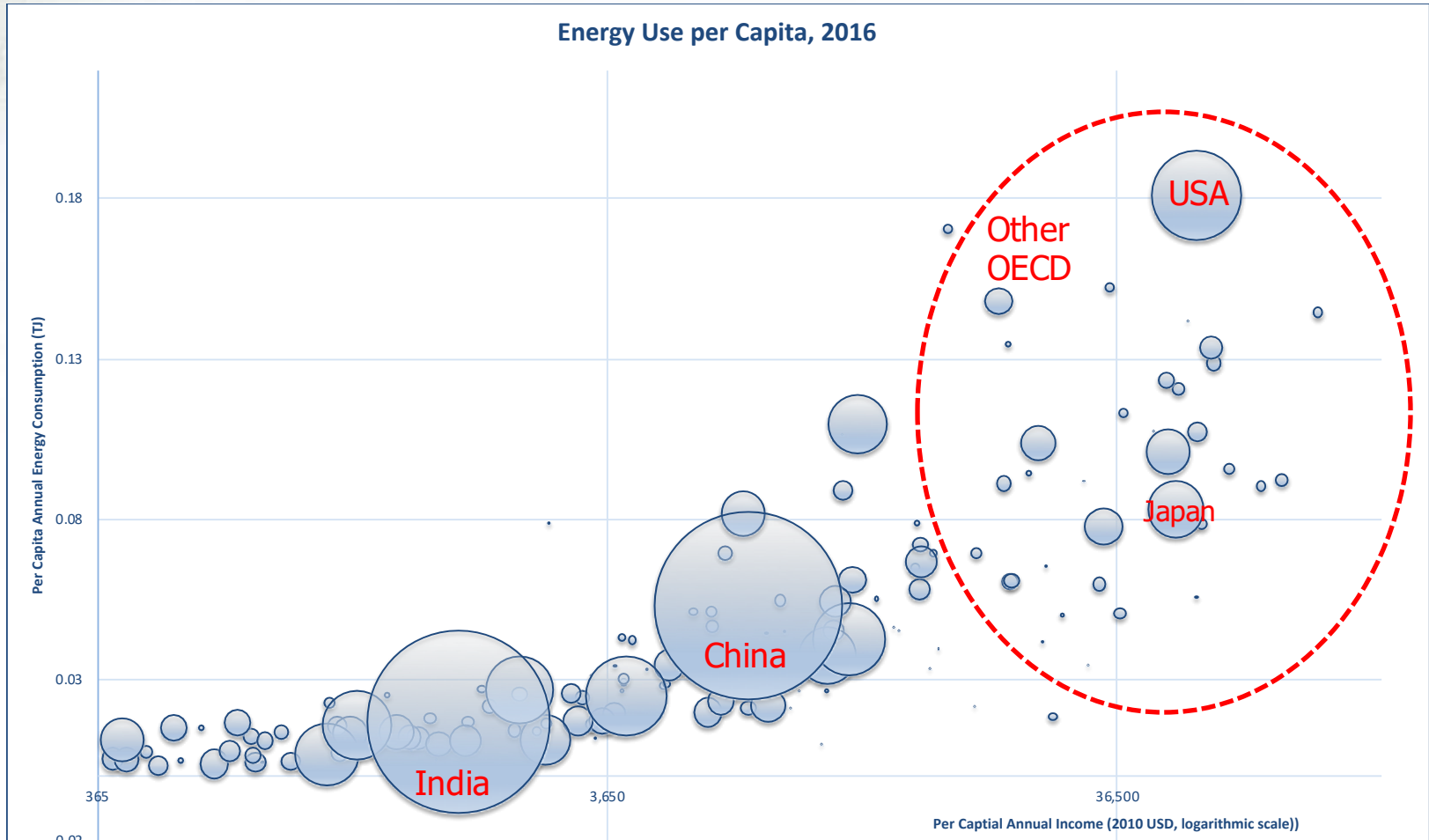
- In the US, costs have fallen over 50% for wind and 70% for solar and battery storage in the last decade.



New Paradigm: Demand

- It's time to redefine energy efficiency
- Energy itself is not a social "problem", it is existing energy's environmental and economic cost
- Saving energy is only one form of efficiency, what efficiency really means is saving money on energy services
- Innovative renewable technologies will allow us to have the energy we need at lower cost

Energy Use and Prosperity are Synonymous



Source: Author estimates from International Energy Agency and World Bank data.
155 countries. Bubble diameter is proportional to population.



Implications for Policy: Technology Supply

- An enabling policy environment
 - Corrects market distortions, gaps between private vs social costs and benefits
 - Evidence-based: CEC has a powerful legacy
- Supply - Incentives for innovation
 - Standards: every time CA establishes a technology standard, it creates an incubator the size of the world's fifth largest economy
 - Clean energy is the next breakout knowledge-intensive sector, after IT and Biotech
 - Subsidies: don't pick winners, do correct distortions

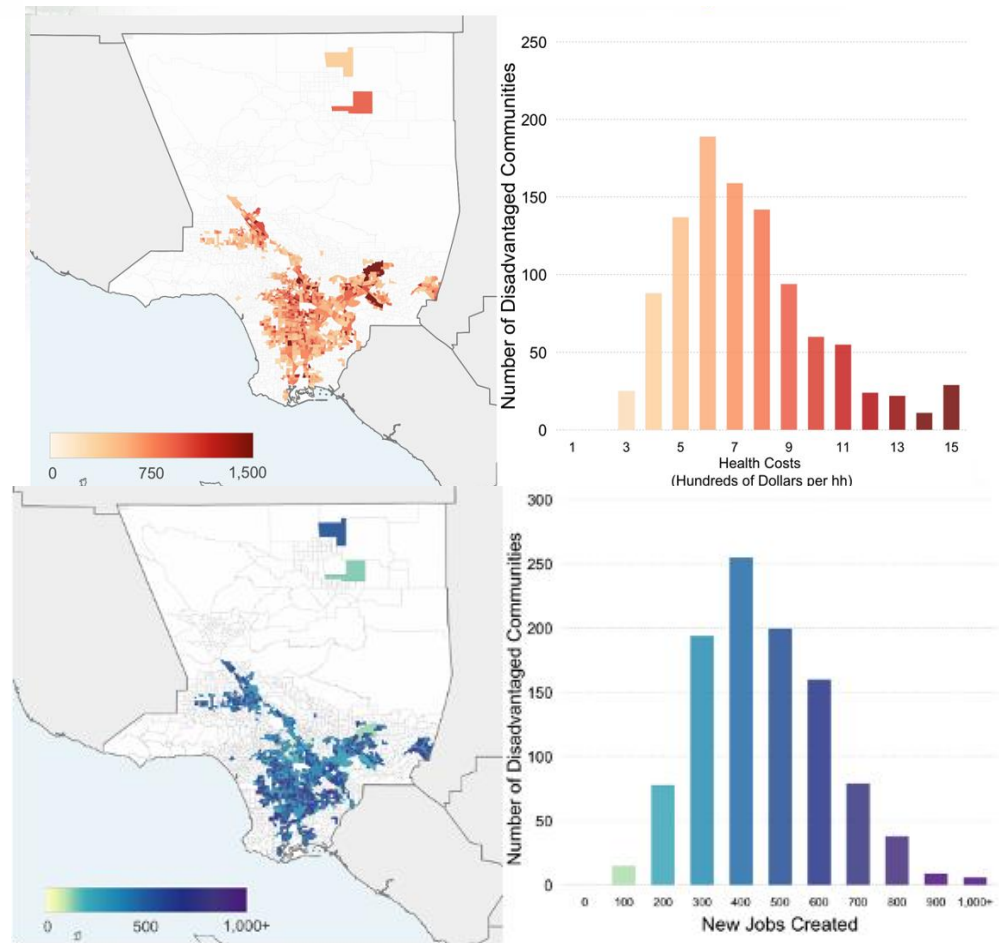
Implications for Policy: Technology Demand

- Technology adoption is about behavior
 - Very difficult to predict, private sector should bear this risk
- Equity issues are very important
 - Large commercial property owners can lead with innovative investments, but these will be less labor intensive
 - Small enterprises and households have higher costs of capital and other financial constraints - but their installation, operation, and maintenance solutions will create more numerous and diverse jobs
 - In the residential space, it is essential to identify and support incentives for both owners and tenants.

Affordability - Heterogeneity

California's Long-Term Energy Strategy Averted Health Costs and Job Creation in Disadvantaged Communities, LA County, 2030

- California's diversity is a great asset, but it poses challenges for policy makers
- In times of dynamic change, it is essential to identify detailed patterns of incidence on both sides of energy/climate policy balance sheets (costs as well as benefits).
- Otherwise, we risk missing many benefits of complementary policies and anticipating adjustment needs for underrepresented groups.



Source: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=223754>

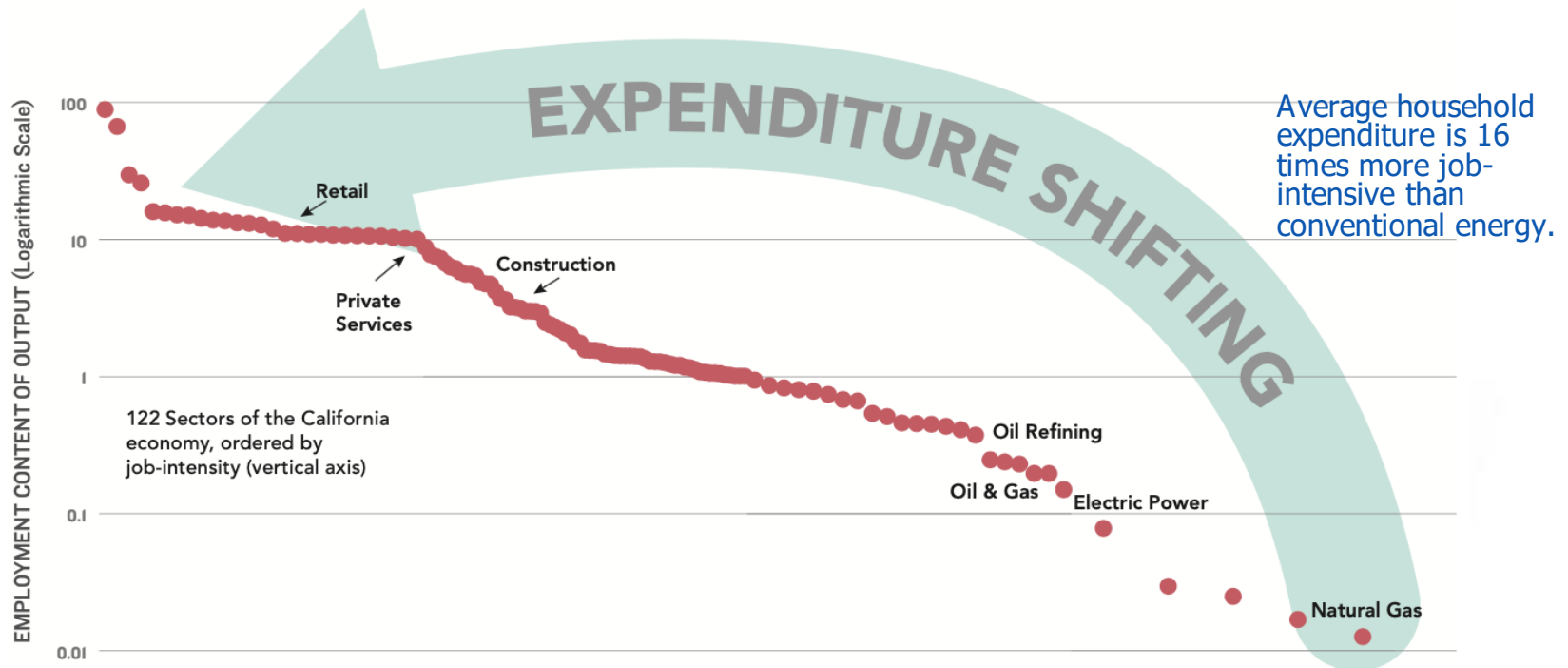


Efficiency and Jobs

- Of course, decarbonization will generate extensive direct employment, but indirect benefits should not be underestimated
- Promoting energy efficiency saves money for households and enterprises
- These savings will be diverted to other expenditures, the majority of which go to in-state services:
 - which employ workers of all skill levels and demographics
 - which are non-tradable, meaning these new jobs cannot be outsourced.

Energy efficiency creates jobs

- The conventional energy supply chain is among the least job-intensive in the economy.
- Shifting expenditure from energy to services stimulates new job growth.



Source: Authors calculations based on data from the US Bureau of Economic Analysis, US Bureau of Labor Statistics, and California Department of Finance⁷⁹

120 Sectors of the California economy, ordered by job-intensity (vertical axis).



Thank you