

Grid Modernization for Local Energy Resources

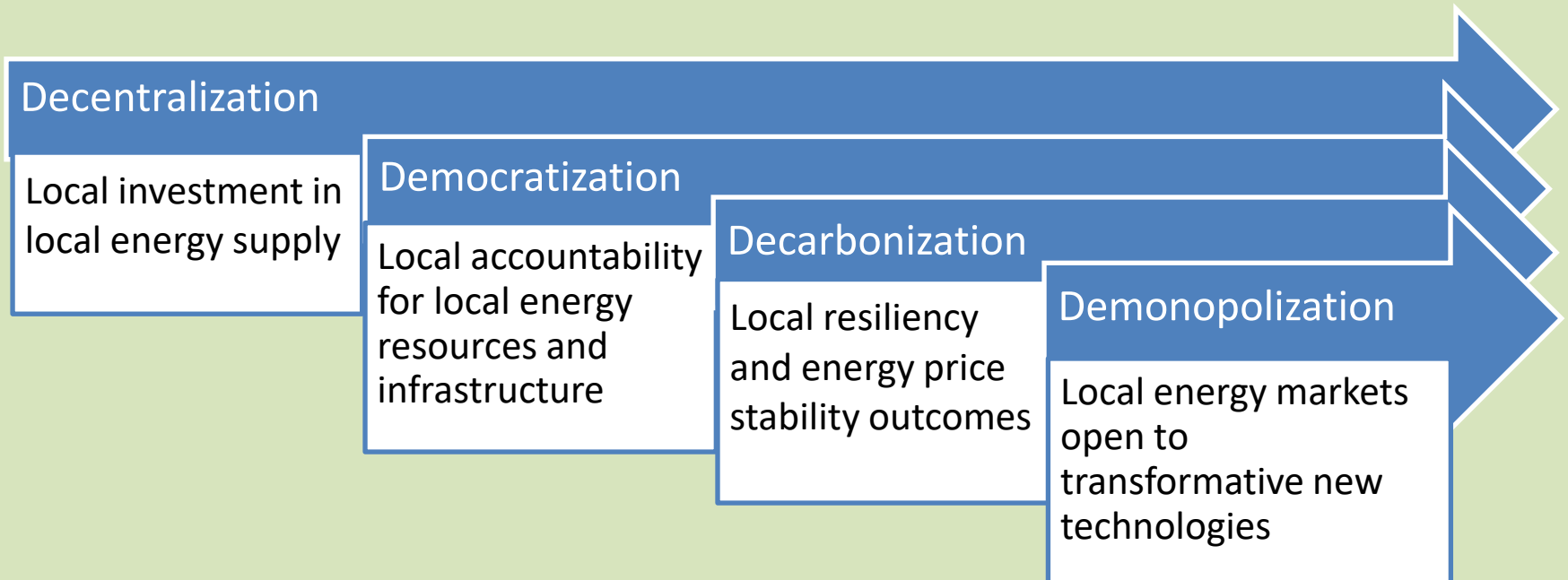
Gerry Braun

Statewide Energy Efficiency Collaborative Forum

Fresno, California

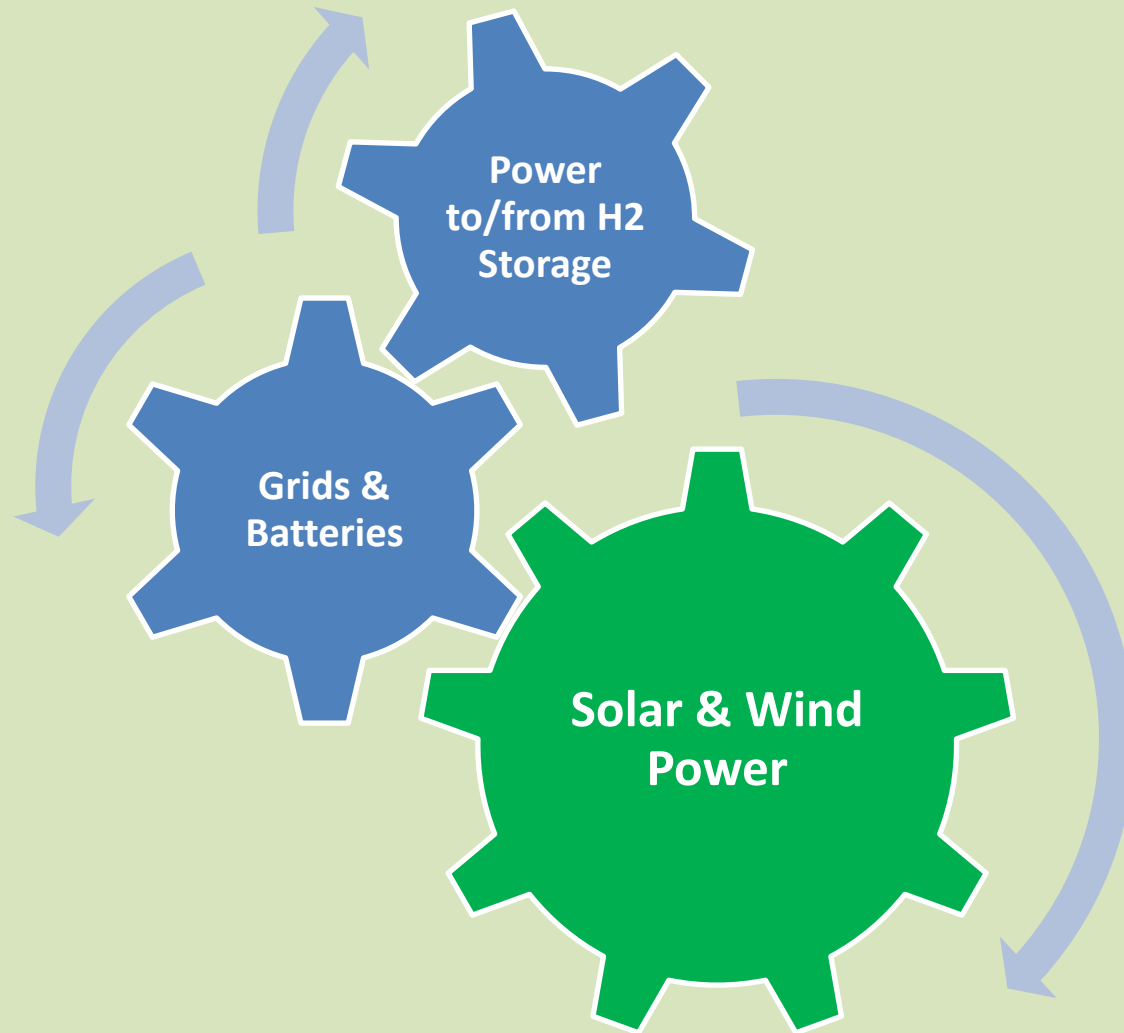
June 15, 2017

Outline



Linear version of a virtuous clean local energy circle

Decentralization: Integrative Clean Energy



Decentralization is a Local Choice

Grid Modernization Pathways: Follow the Money



In California, how much “grid modernization” money is forecast to follow Wall Street pathway vs. pathways within communities?

Decentralization is a Local Choice

Grid Modernization Pathways: Follow the Money

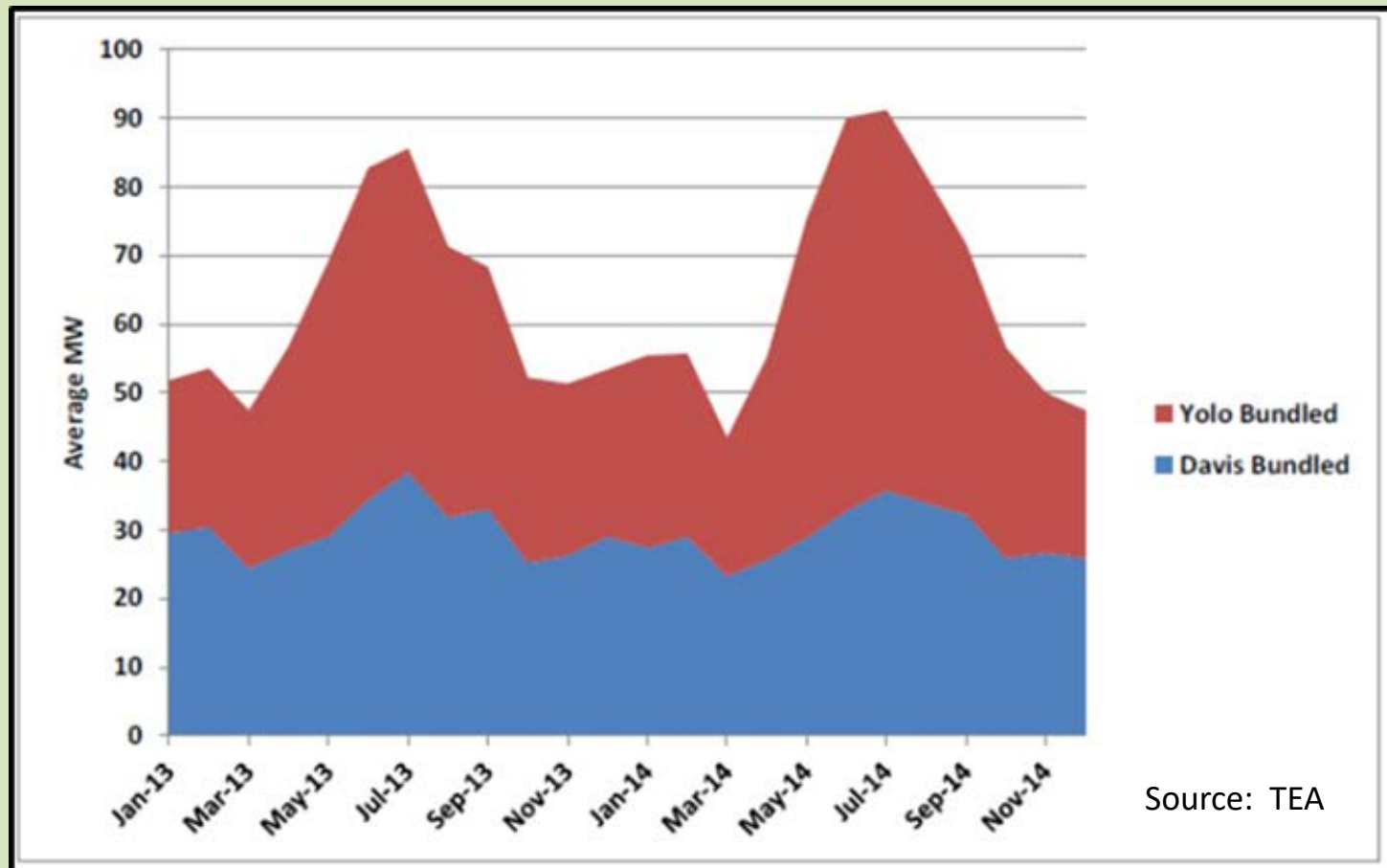


“The company (PG&E) expects to spend \$5.6 billion this year, including \$2 billion on distribution, \$1.2 billion on transmission and \$700 million on generation, with annual investments ranging from \$5.4 billion to \$6.4 billion over the next three years.”

PG&E’s forecast for “behind-the-meter” generation additions in the next three years of roughly 1GW/year*. Related local investment will be in the range of \$3B/year or considerably higher if some PV additions include energy storage.

*DRP DER Growth Scenarios Workshop, May 3, 2017

Decentralization: Example of Demand Profile Differences – City (blue) vs. County (red)



Democratization: Two Visions of Community Choice

Old – Imported Energy



- Natural Gas Power Plants
- Utility Scale Renewables

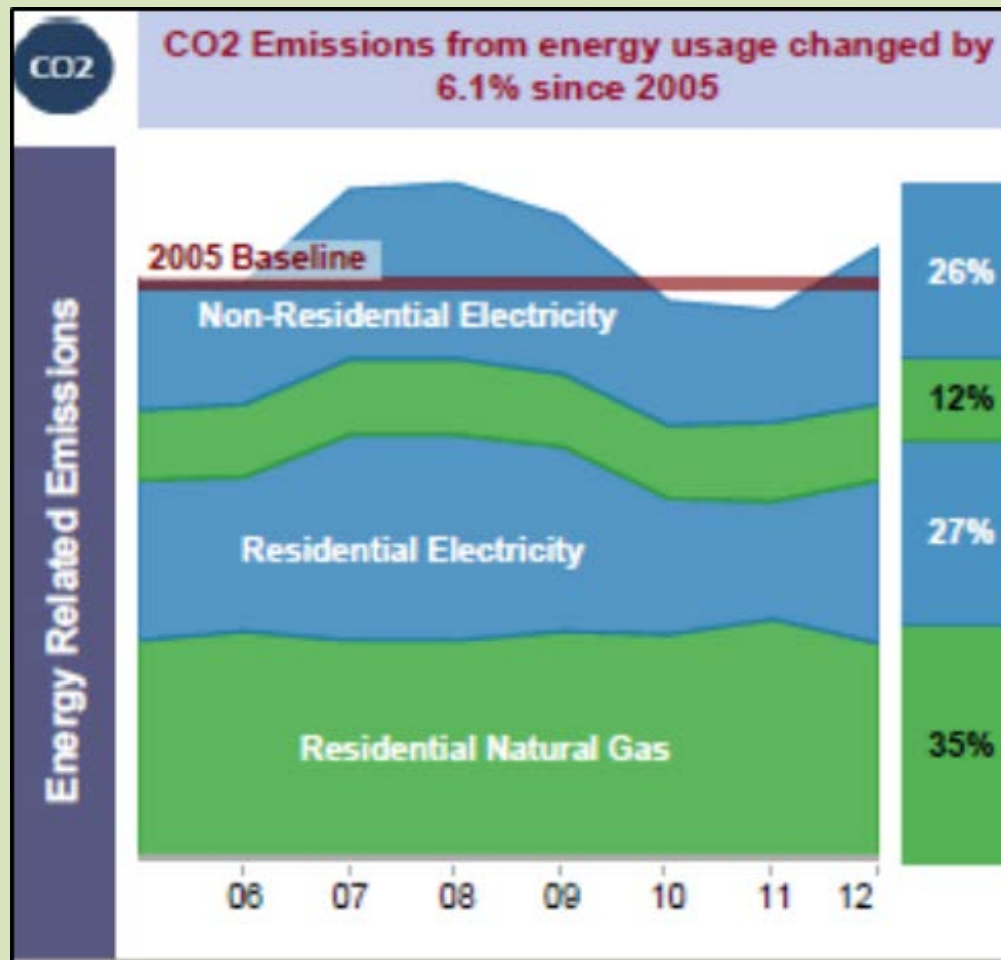
Future – Local Energy +



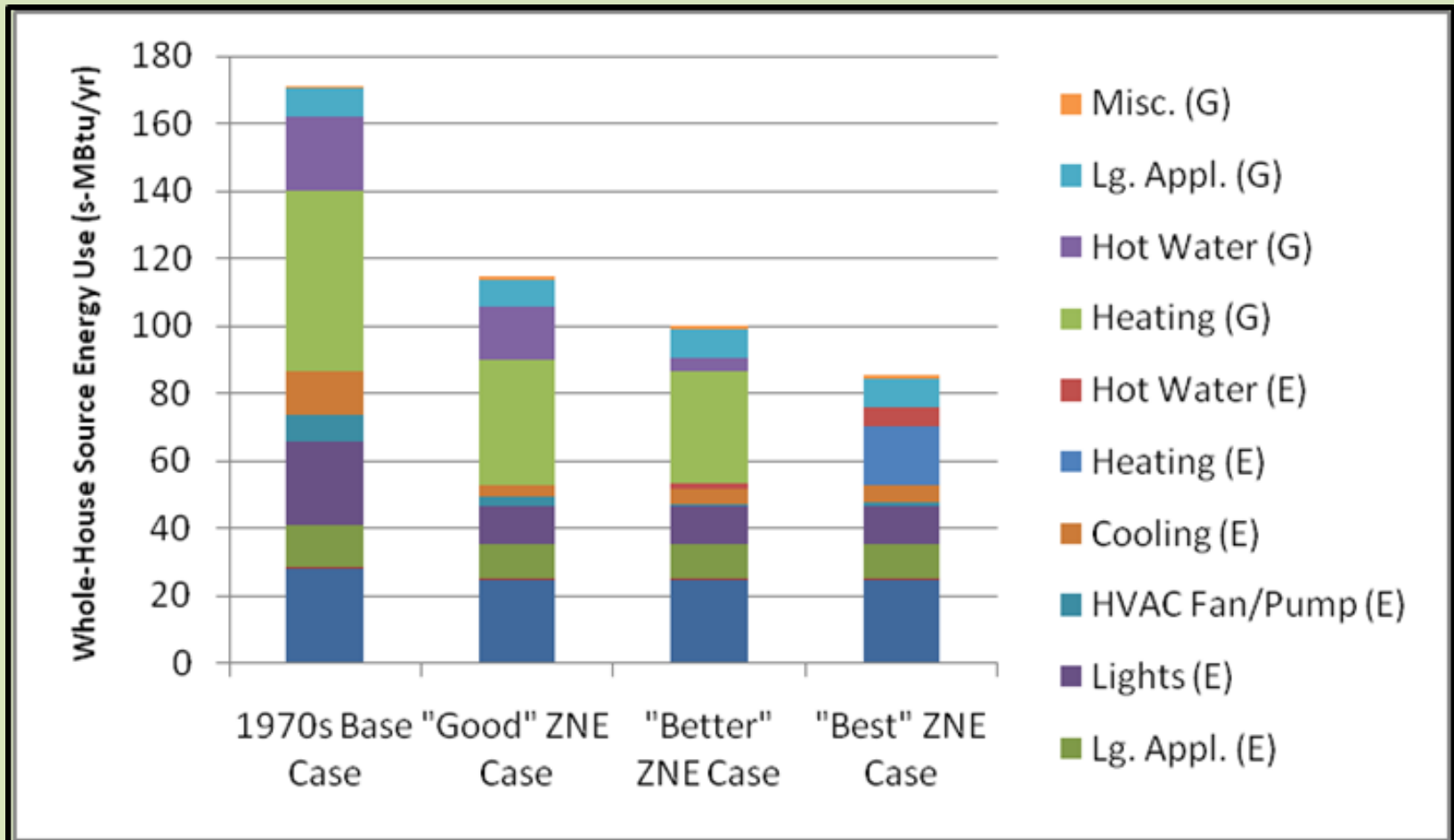
- Utility Scale Renewables and Storage

- Community Solar & Wind
- On site Solar
- Zero Carbon Vehicles

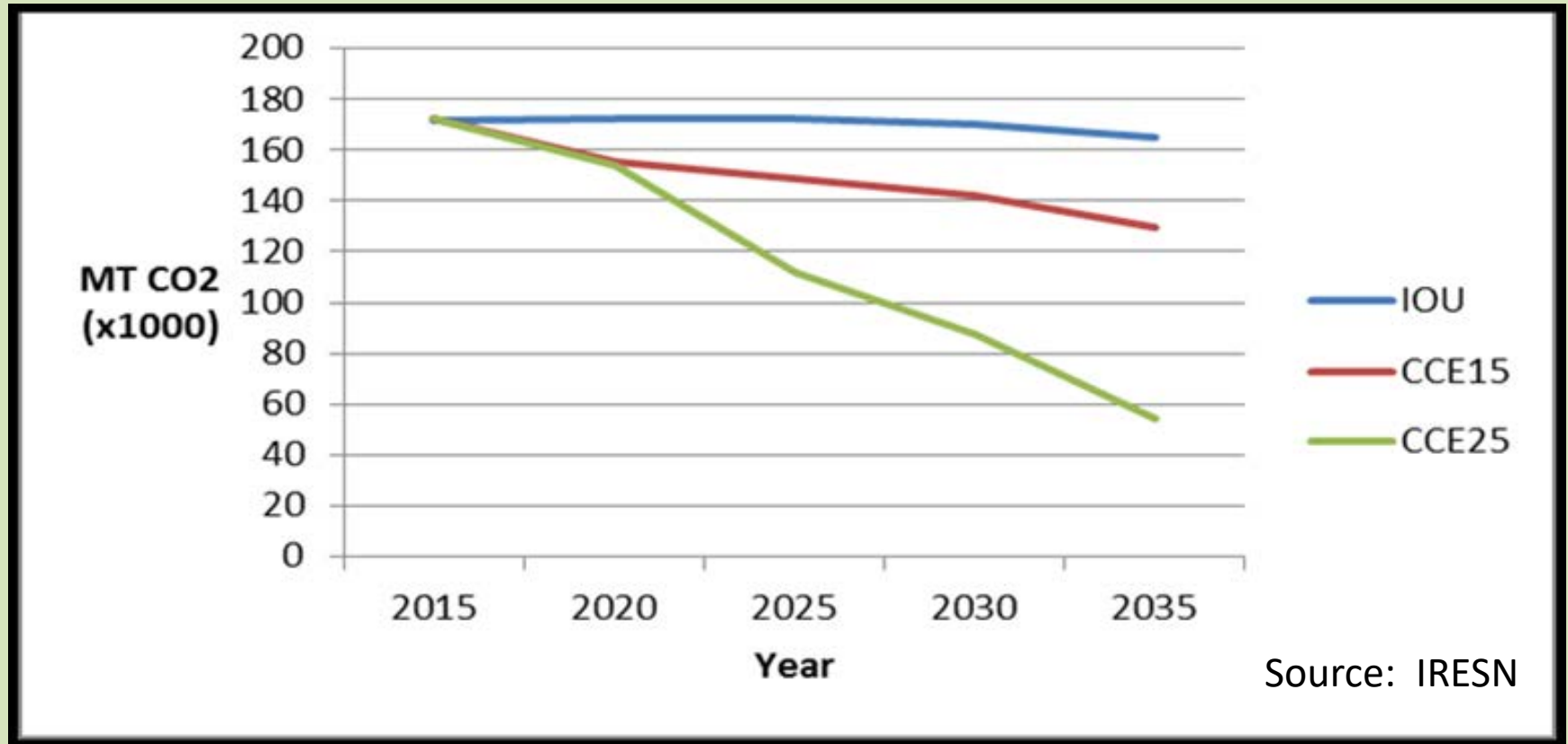
Decarbonization: Buildings Sector GHG Emissions Profile for Davis, California



Decarbonization: 1970s Vintage Home Net Zero Retrofit Energy Usage Reductions (Davis, CA)



Decarbonization: GHG Emission Reduction in Three Scenarios for Davis, California

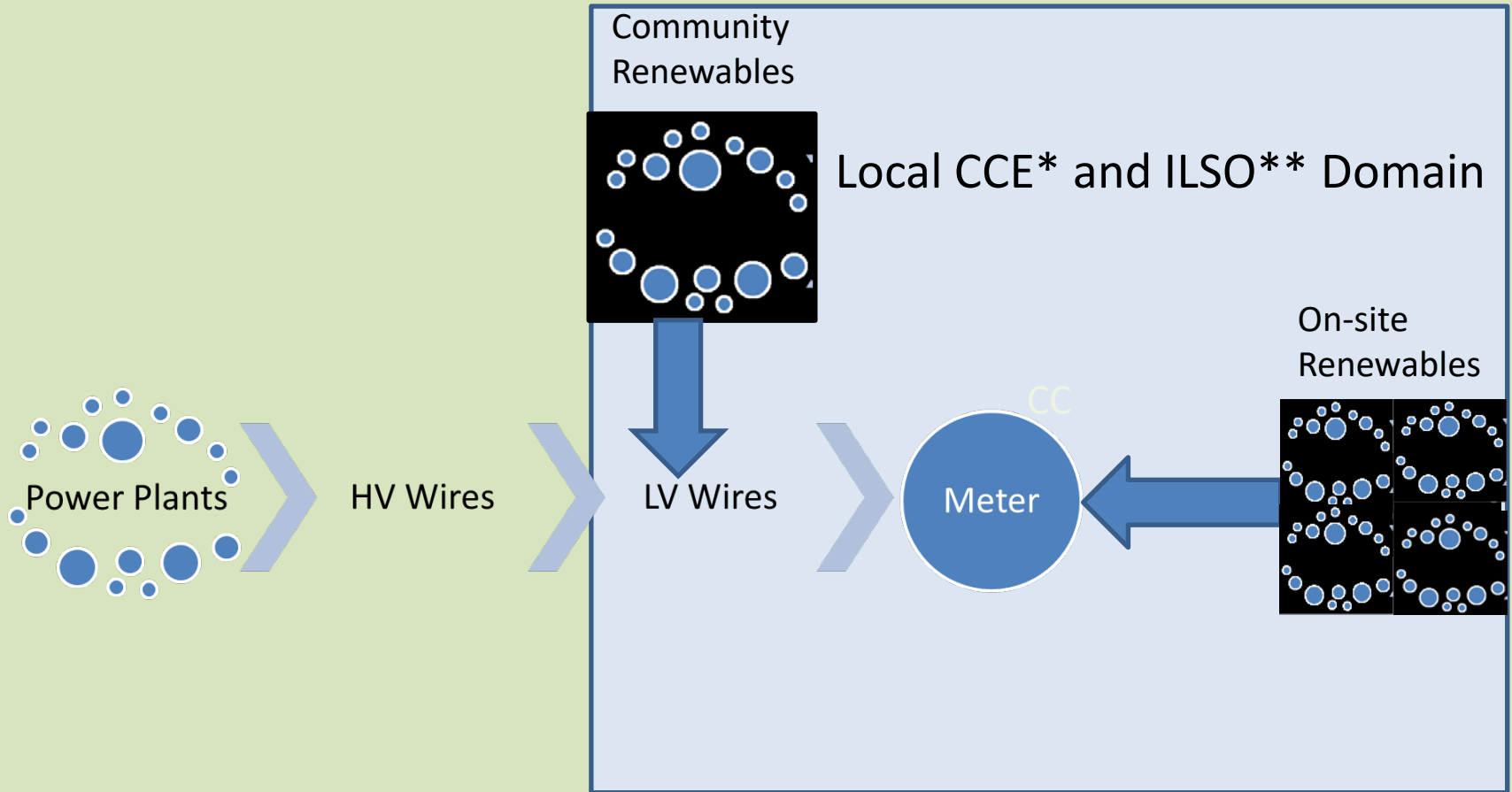


IOU = Business as Usual

CCE15 = Community Choice Energy (CCE)

CCE25 = CCE with Local Energy Resource and Fuel Substitution Emphasis

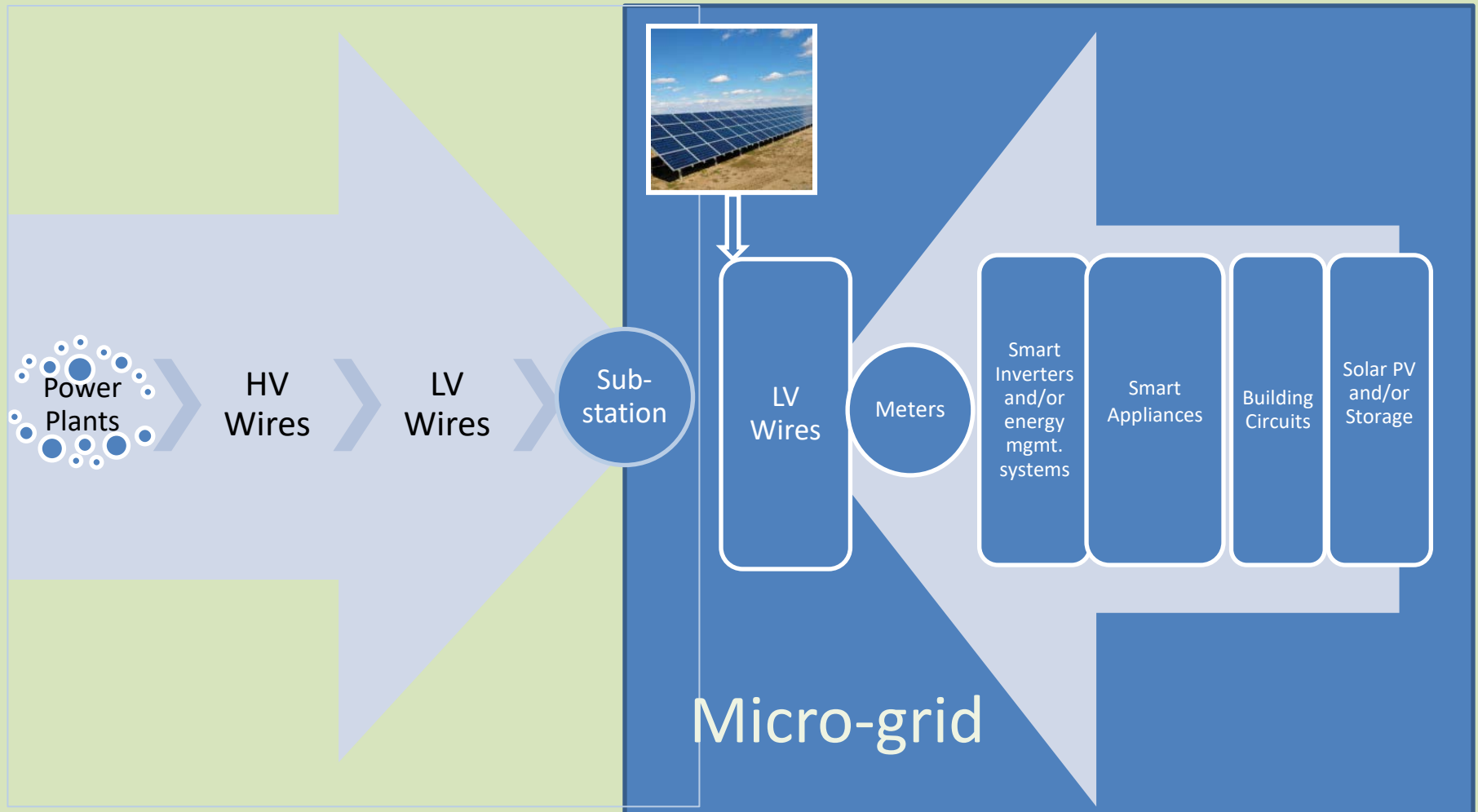
Demonopolization: System Architecture for Local Clean Energy Resources



*Community Choice Energy

**Independent Local System Operator

Demonopolization: Solar Micro-grid Concept



Recap - 1

- Energy/transportation technology tipping points make energy decentralization inevitable.
- Importing energy means exporting dollars. Now how much to import is becoming a local choice.
- Community choice enables community solar and also urban/rural energy exchange.
- Timely local decarbonization hinges on mass marketing of smart energy retrofits.

Recap - 2

- Community Choice is natural partner in clean local energy resource (CLER) deployment, not a substitute for active city/county engagement.
- Economically optimum CLER deployment may require creation of local independent system operators.
- Solar micro-grids provide resiliency benefits and enable more economically efficient mixed portfolios of residential and community solar.

Let's help one another remember:
We are at a point in human history where, if it isn't
happening, it's because we aren't doing it!

Thank You!

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