

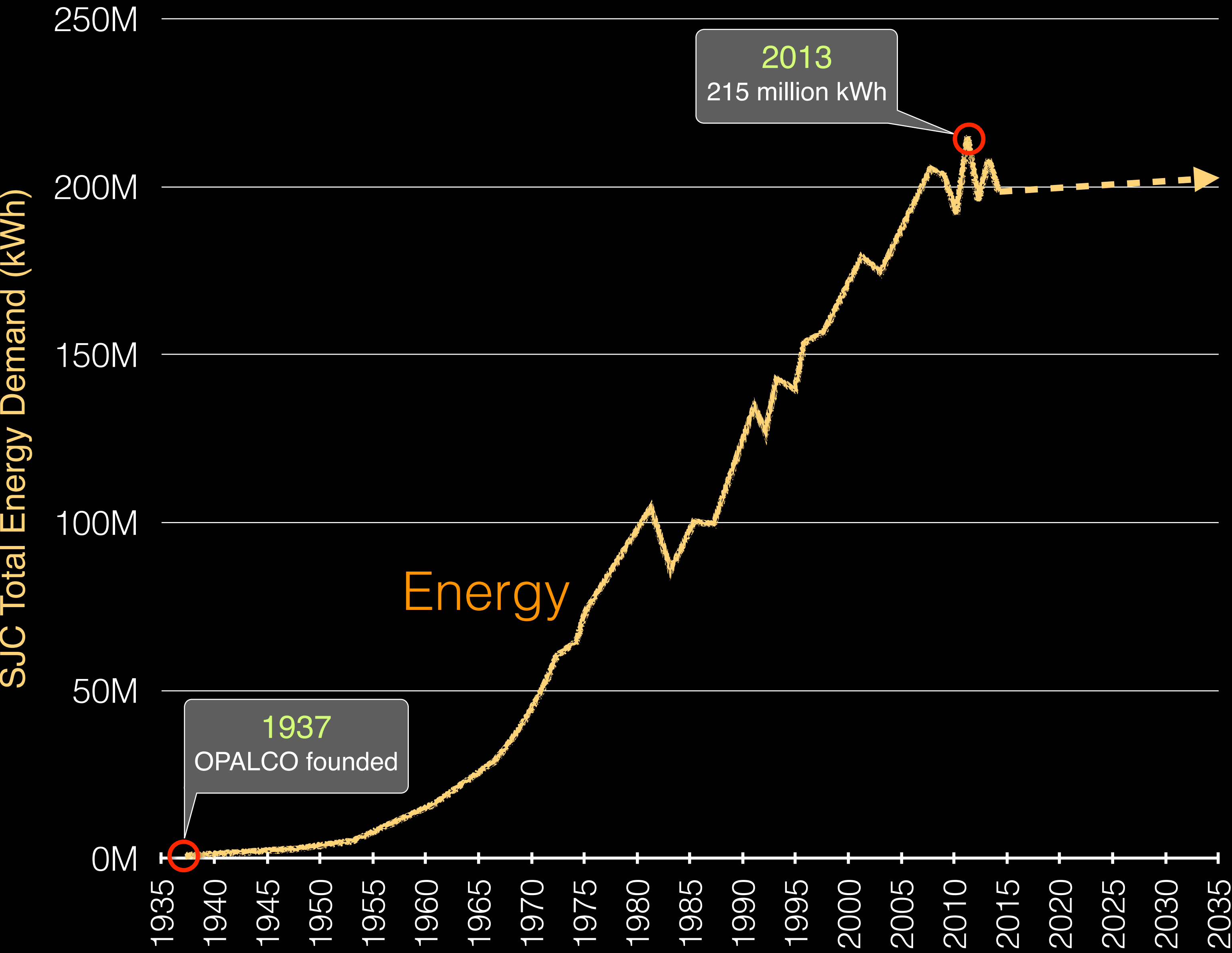
# OPALCO

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Board Meeting - September 2015

Integrated Resource Plan Overview

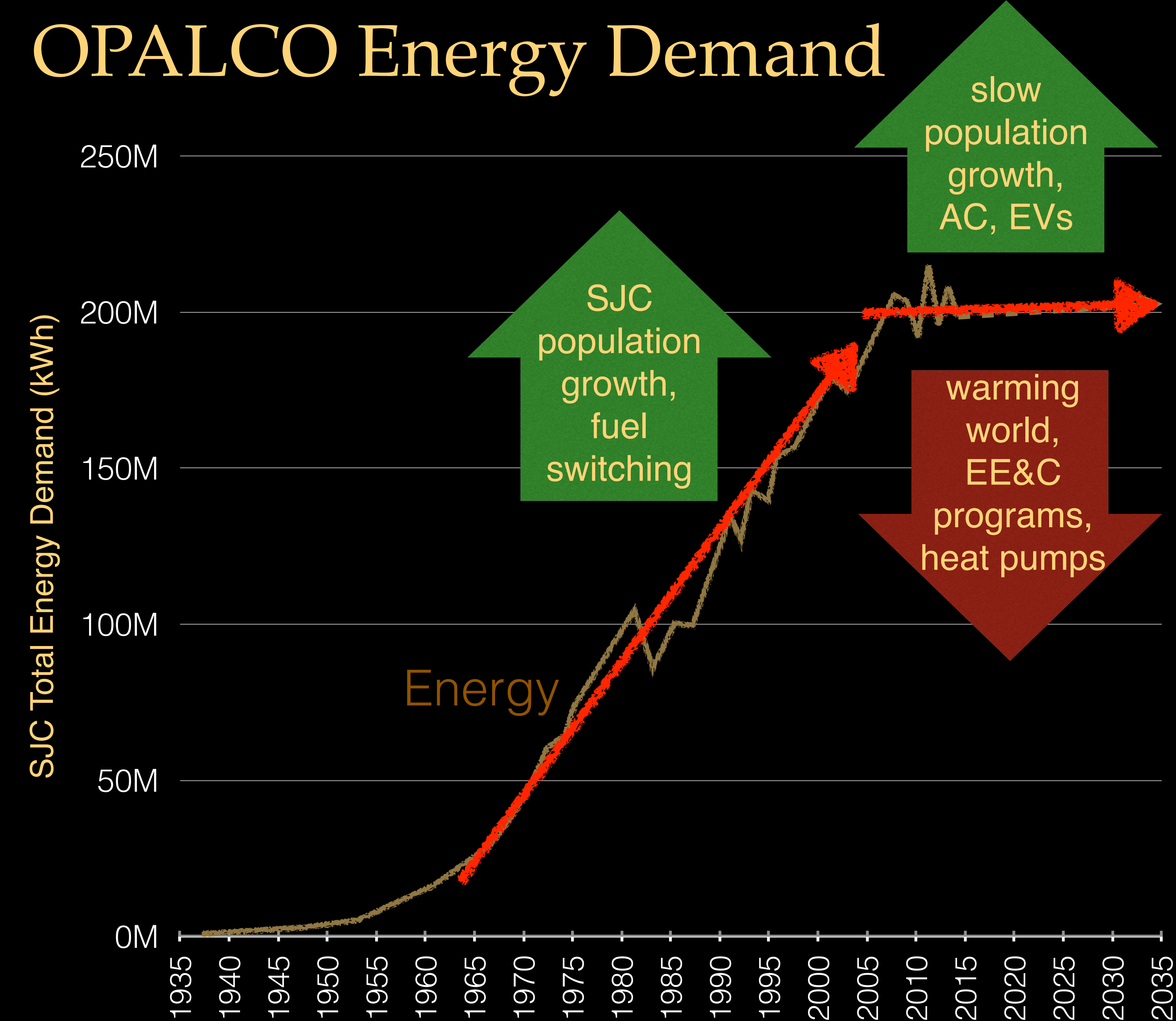
# OPALCO Energy Demand



## Headline

- Exponential growth in 20th Century
- Transitioning to low growth in 21st Century

# OPALCO Energy Demand



## Headline

- In the 20th Century, SJC electric energy demand was driven by:
  - population growth and
  - fuel switching from wood, propane and fuel oil heating
- In the 21st Century, SJC energy demand is projected to be flat - driven up by:
  - slow population growth, and
  - emerging load from AC and EVs,and driven down by:
  - Energy Efficiency & Conservation programs (EE&C),
  - reduced heat load due to a warming world, and increased use of super efficient heat pumps.

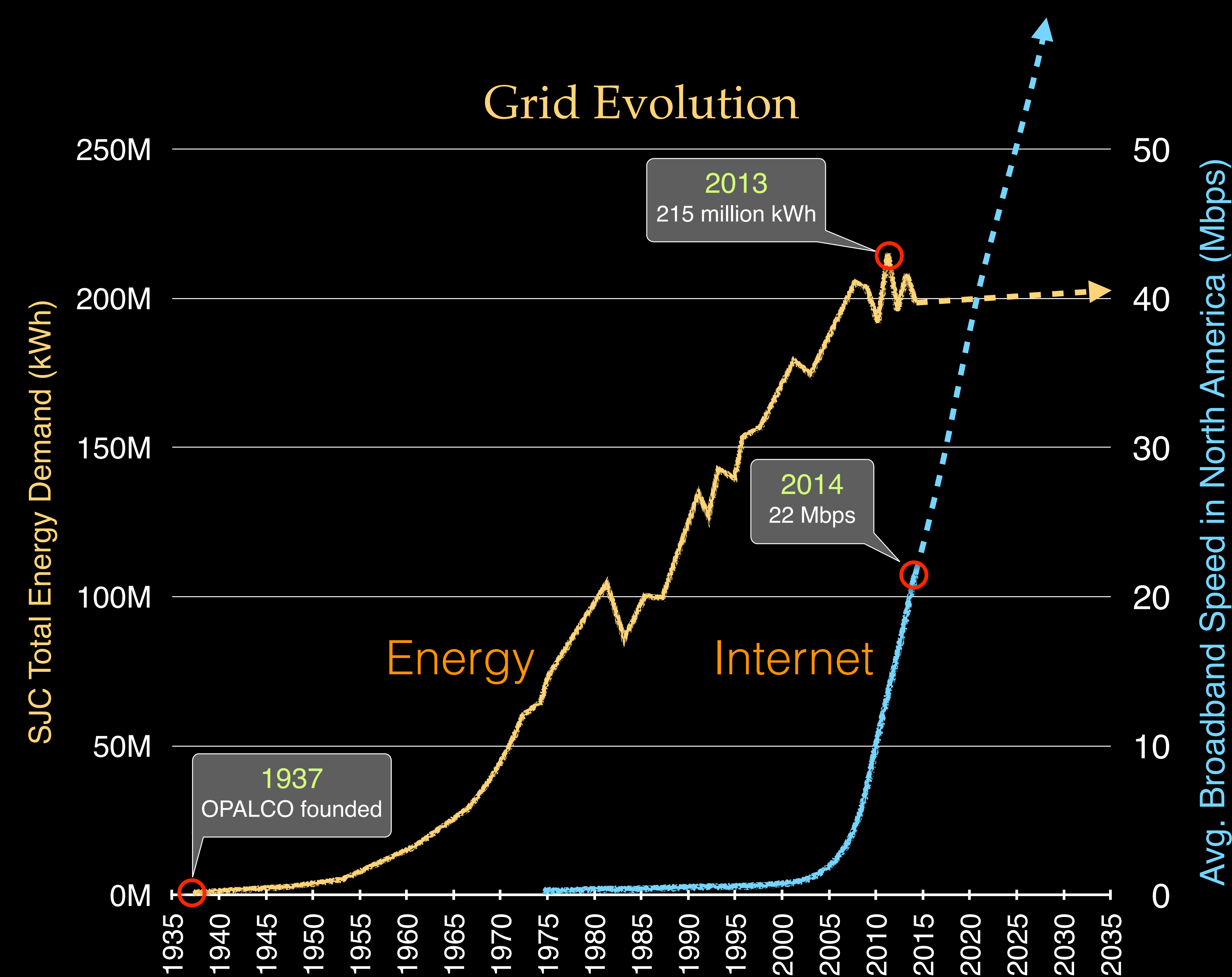
# Internet is the Energy of the 21st Century

## Headline

- SJC energy demand is projected to be flat in coming decades
- Demand for fast reliable internet is growing exponentially
- Rural electric co-ops are transitioning to a hybrid model - providing energy and internet services

## Notes

- Energy demand is tempered by slowing population growth, warming world, and increased conservation and efficiency
- Internet speed is driven by transition from text to multimedia (pictures, video) and mobile smartphone growth

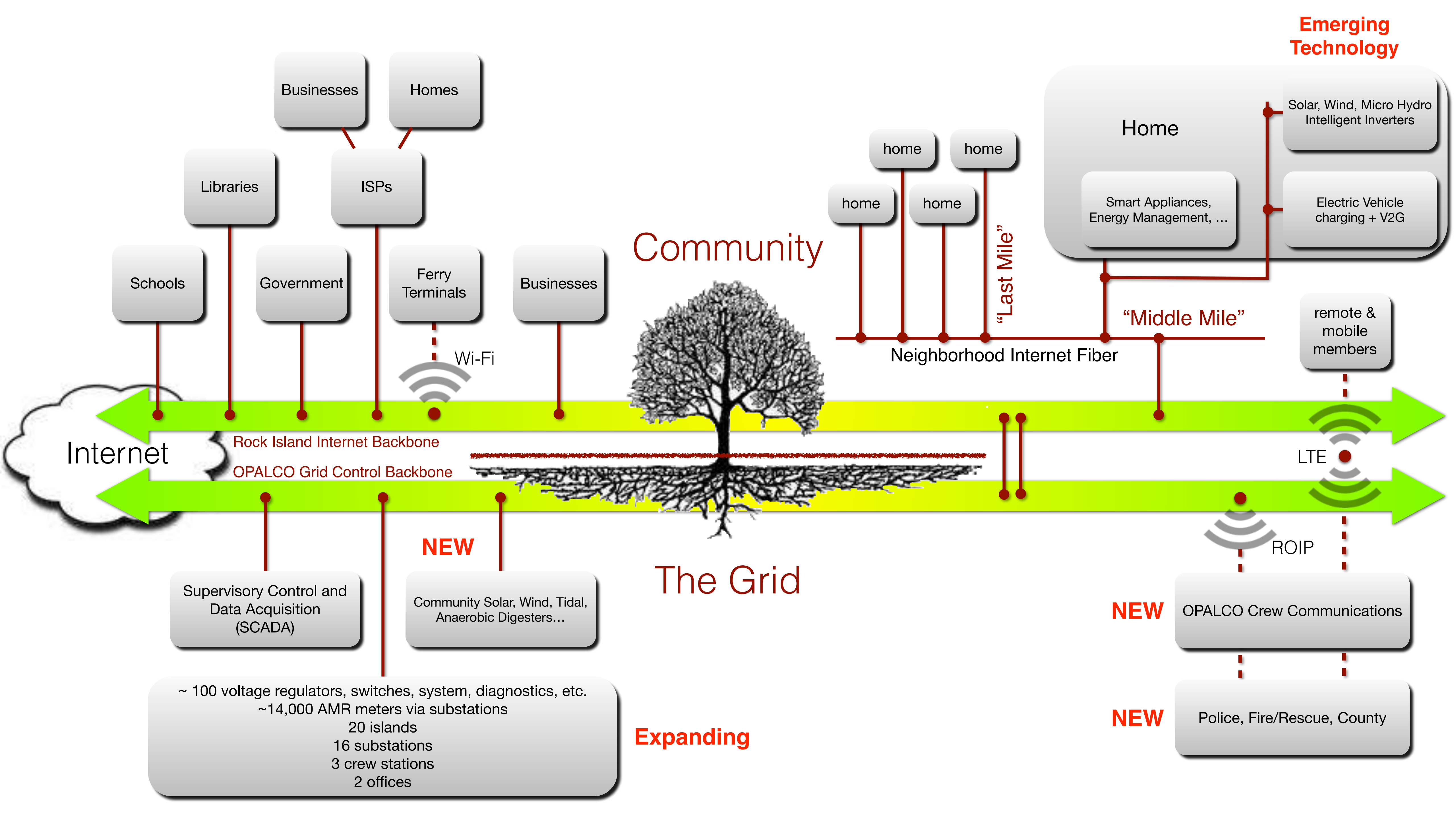




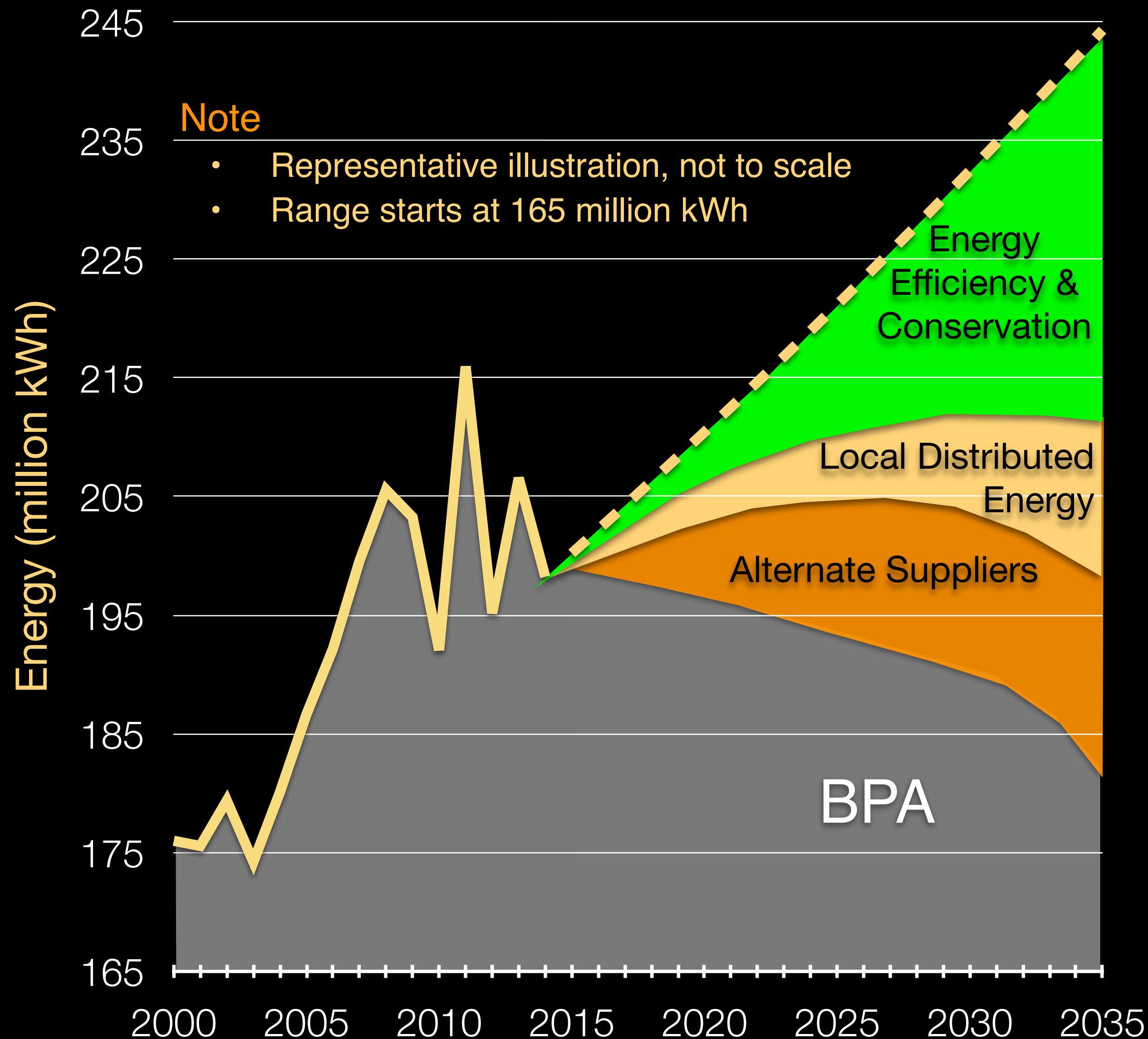
Local distributed energy resources will increasingly contribute to the county's enormous 75 MW peak load.

They will be interconnected by OPALCO's grid and firmed up with BPA energy from the mainland.

*Delivering reliable, safe, affordable energy on demand in the Northwest, with its significant winter solar deficit, requires hybrid solutions combining intermittent solar, wind, tidal energy, and firmed up with BPA and storage resources, interconnected in an efficient well-managed grid.*



# Power Supply Resource Strategy



## Board Directive #2

OPALCO will maintain a longterm evolving **strategic power supply resource plan** to provide safe, adequate, reliable, advantageously priced power including appropriate mitigation of **source risk**, **economic**, **climate** and **energy policy** uncertainty.

- Maintain **BPA** as our primary longterm power supplier.
- Investigate and form relationships with **alternate suppliers** of power.
- Implement **energy efficiency and conservation** programs as a cost effective power resource. These include member projects, BPA programs, and OPALCO infrastructure improvements.
- Encourage **local generation** installations consistent with our OPALCO grid operations.



# Grid Evolution: Resources

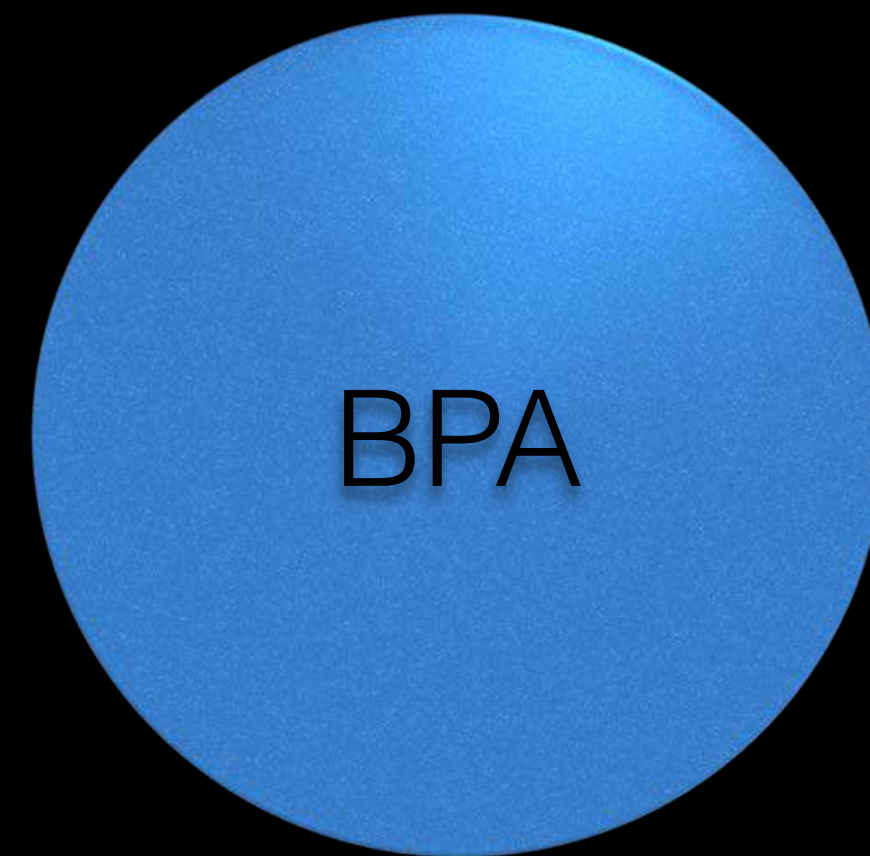
Past



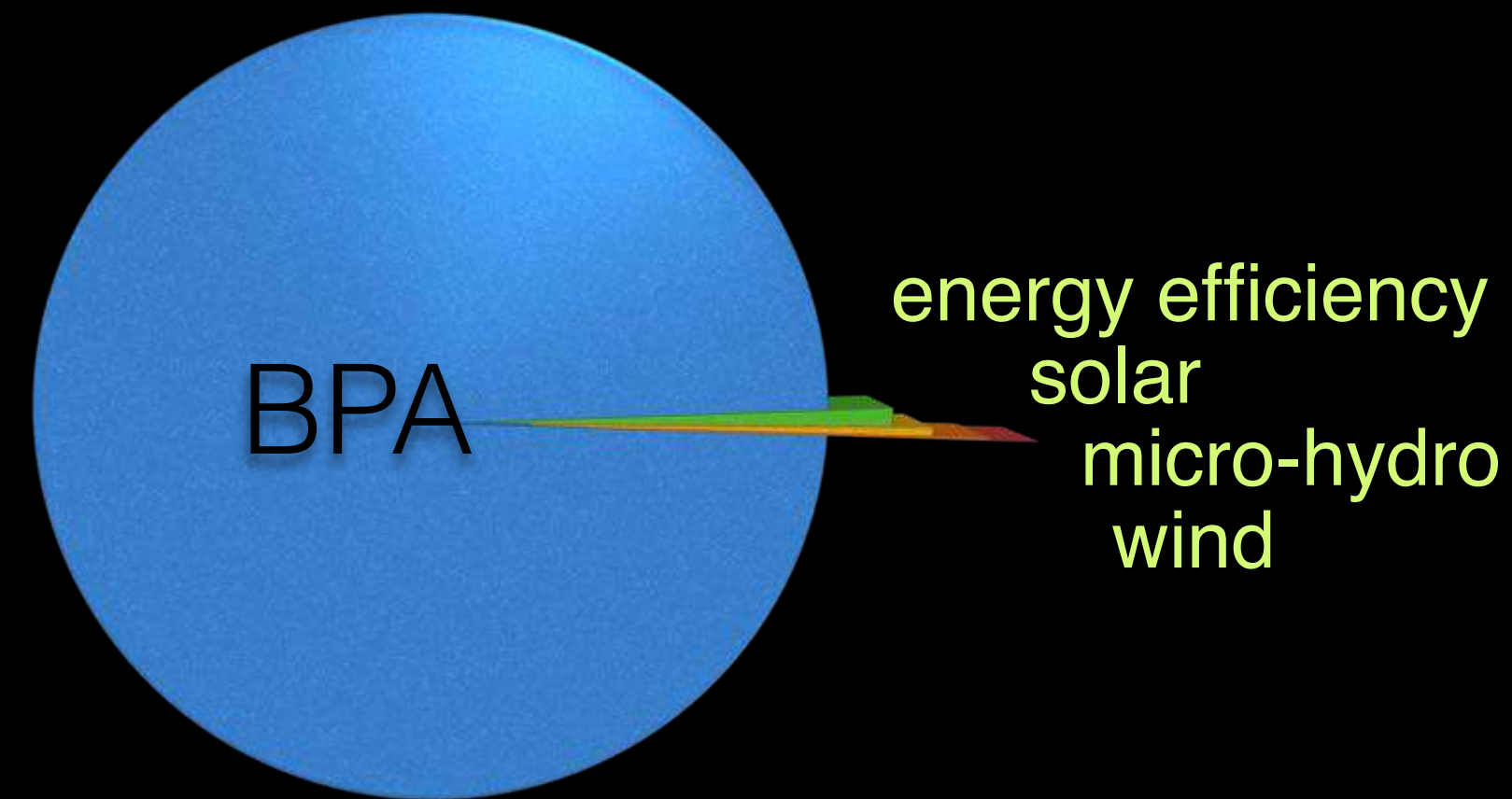
Present



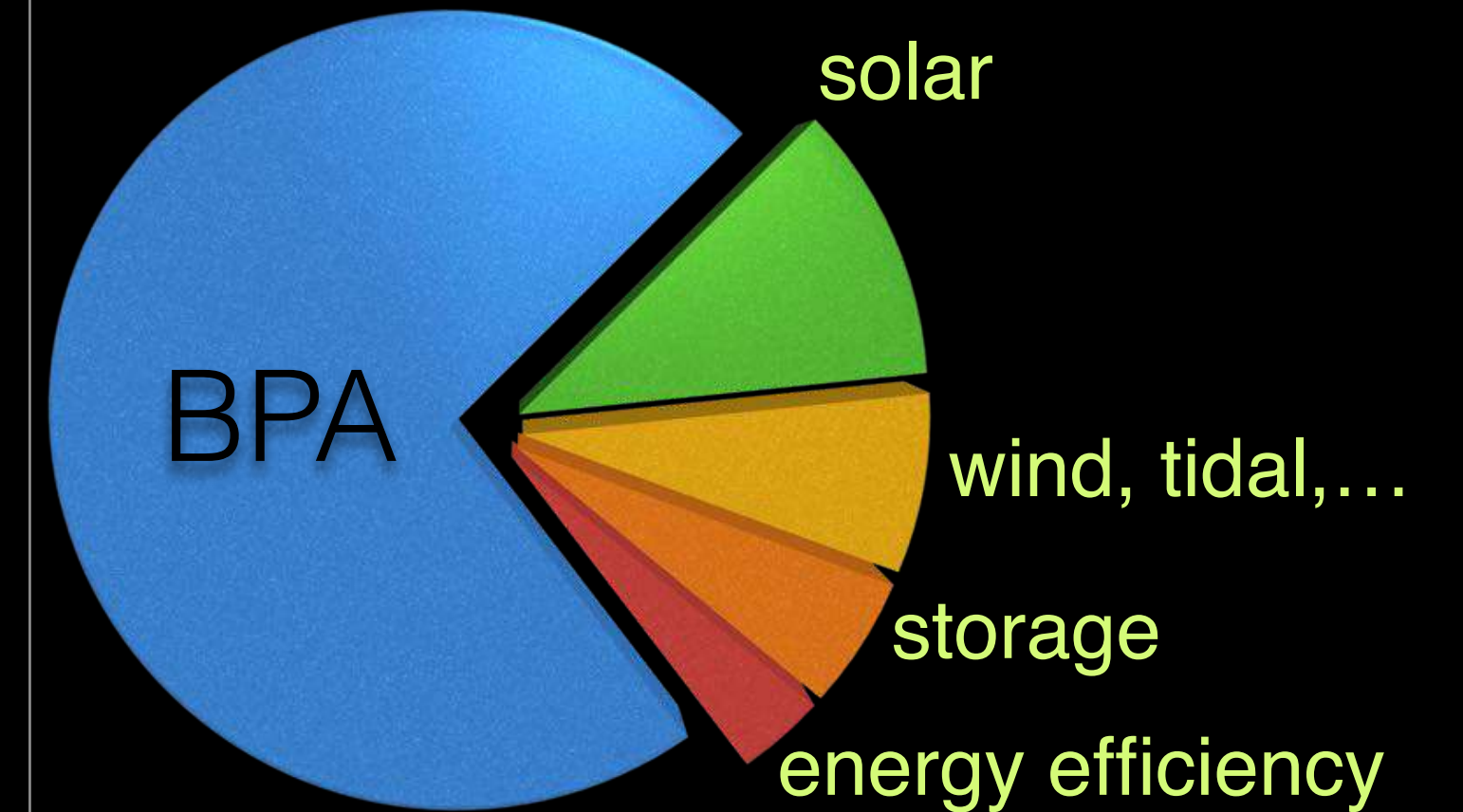
Future



All BPA



Ramping up EE&C, and  
local renewables



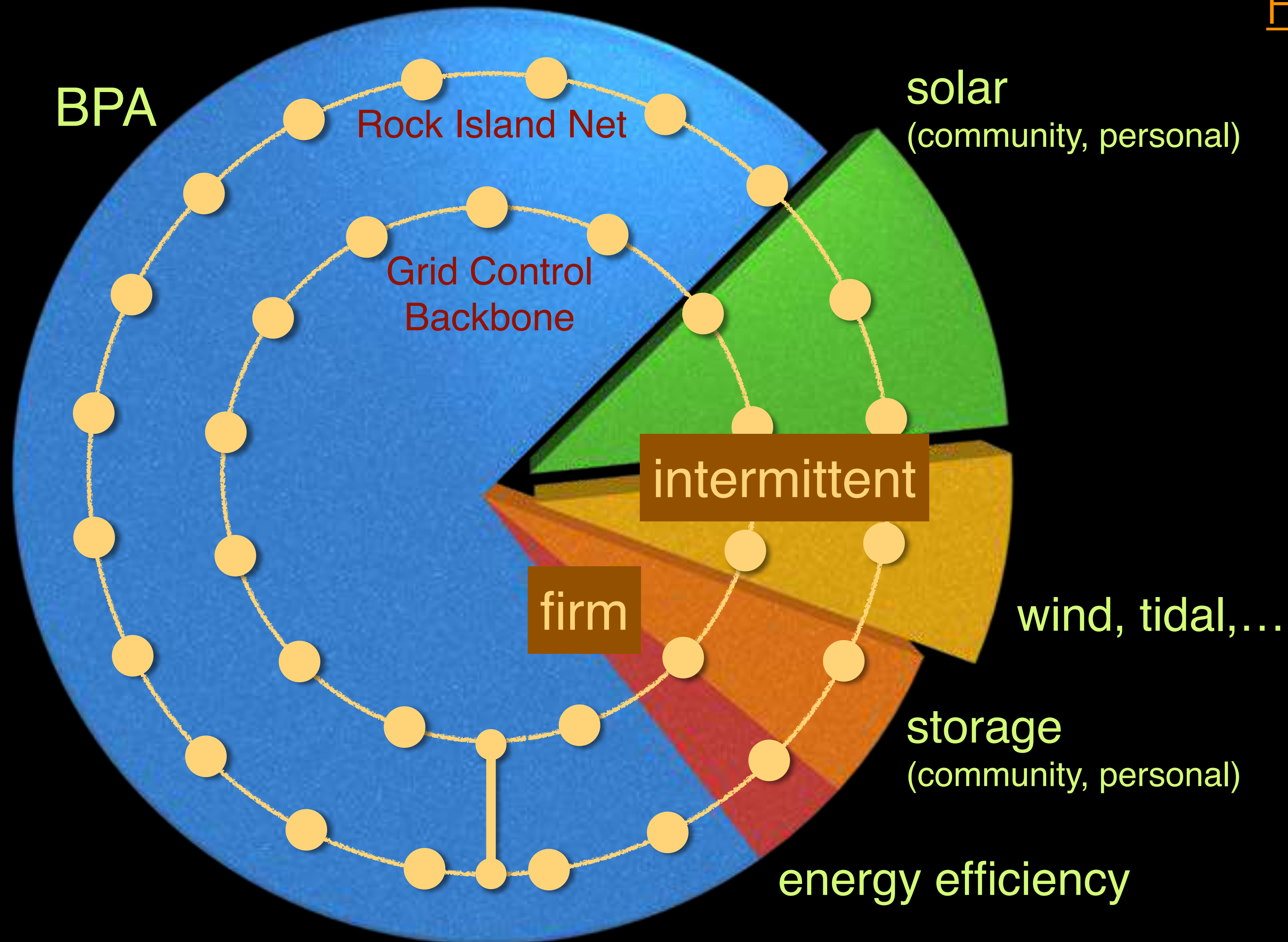
Increased local distributed  
resource mix

Note: Proportions are  
representational



# Grid Evolution: Resources

## Headline

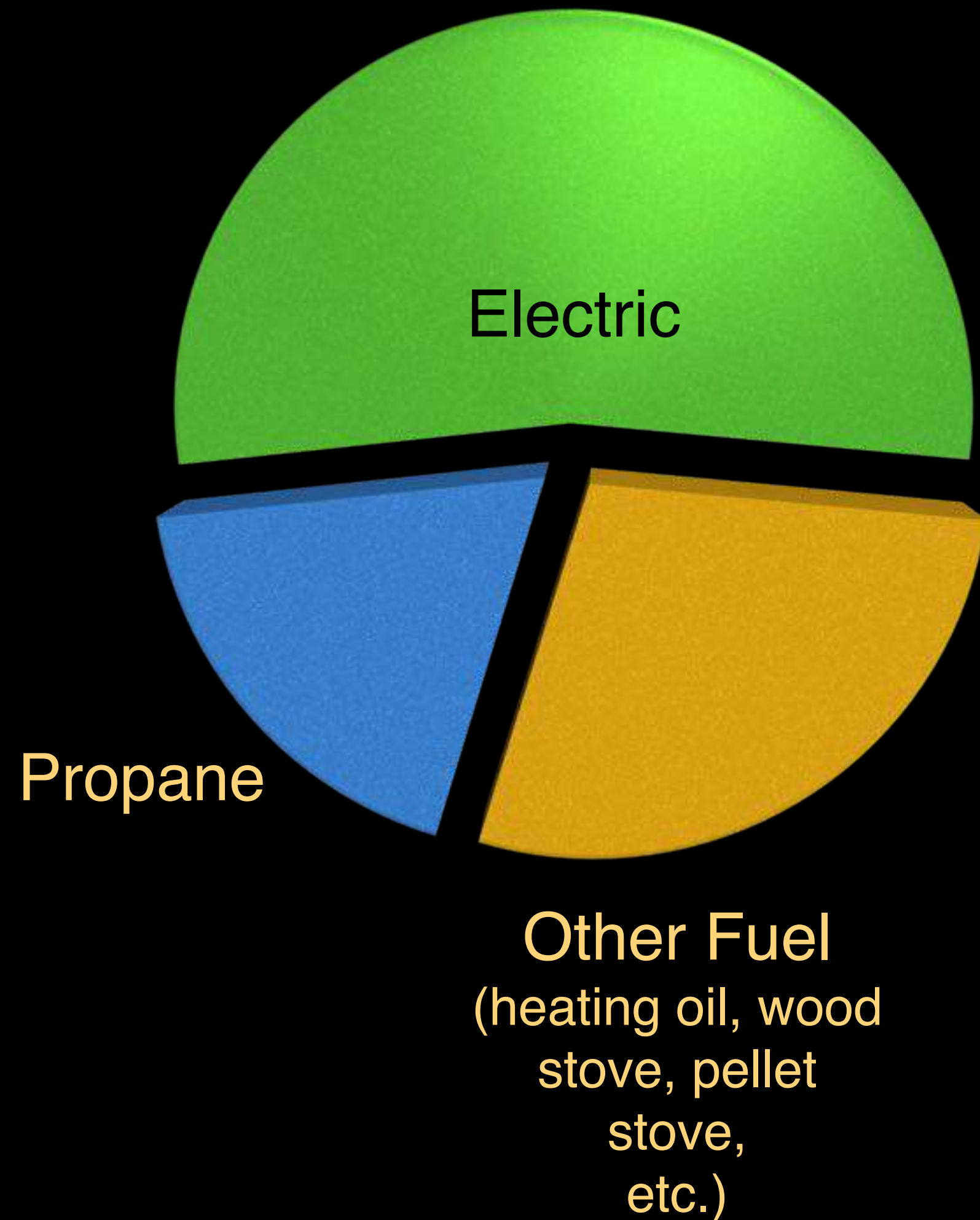


- Our connection to the mainland is and will remain essential to meet the winter 75 MW peak load
- Over the coming decades, our energy resources will become more **local** and **diversified**
- Local energy resources will be more **intermittent**, requiring a well managed combination of firm energy (BPA, batteries, EVs, micro-hydro, etc.)
- Fossil fuels will **shift** to clean affordable electric (heating, water heaters, cars)
- The grid will evolve into a **2-way** “**inter-grid**” that connects each of these resources, to maximize reliability, safety, and affordability of energy services
- This inter-grid will be a combination of **Grid Control Backbone** and **home** and **business** internet networks, connecting intelligent inverters, storage, personal and utility energy management functions
- The 2-way inter-grid allows members to **BUY** and **SELL** energy - at favorable **time of use** (TOU) and **time of generation** (TOG) market rates.



# Grid Evolution: Heating Fuel Types

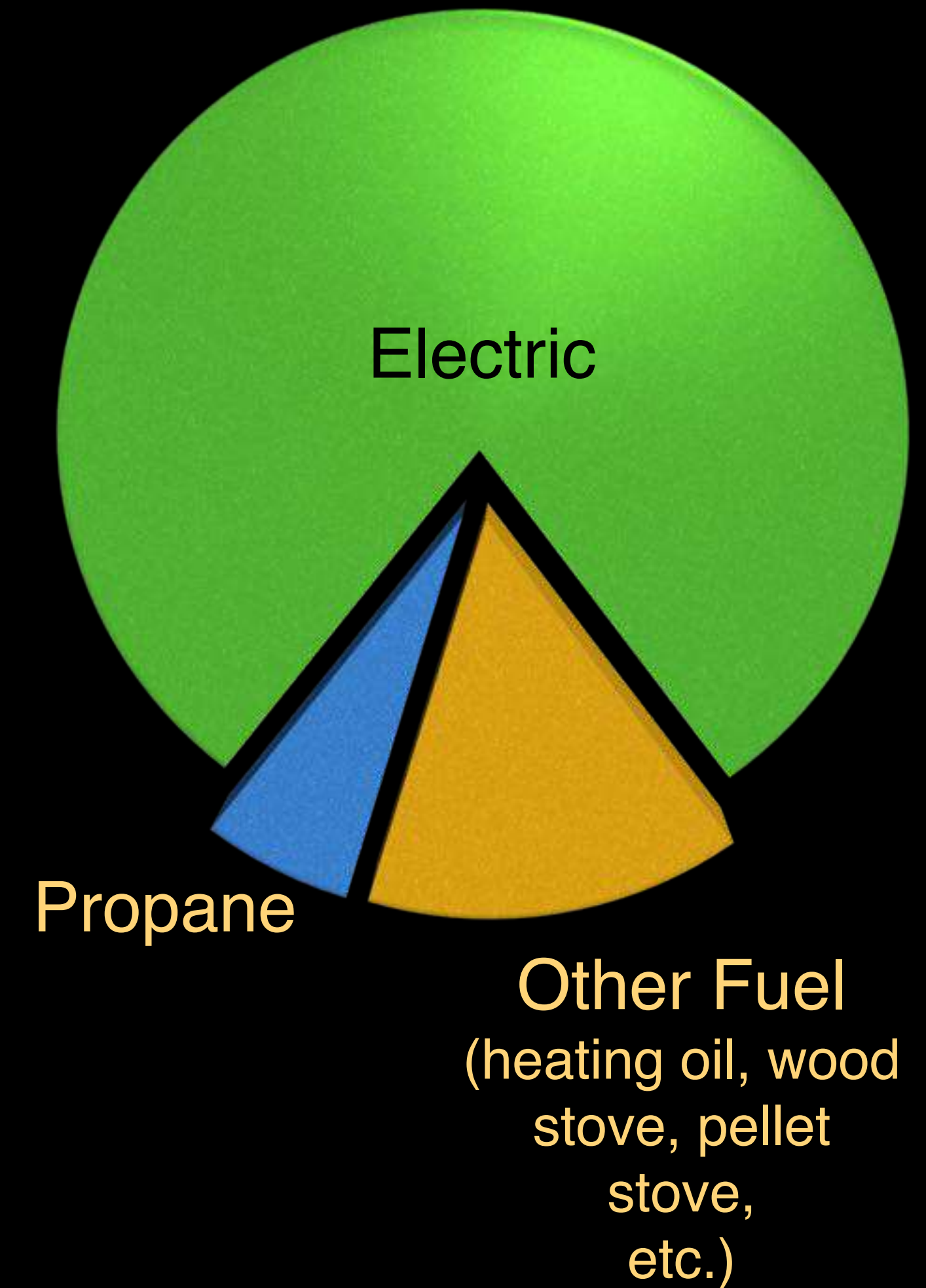
Present



Fuel Switching Initiative



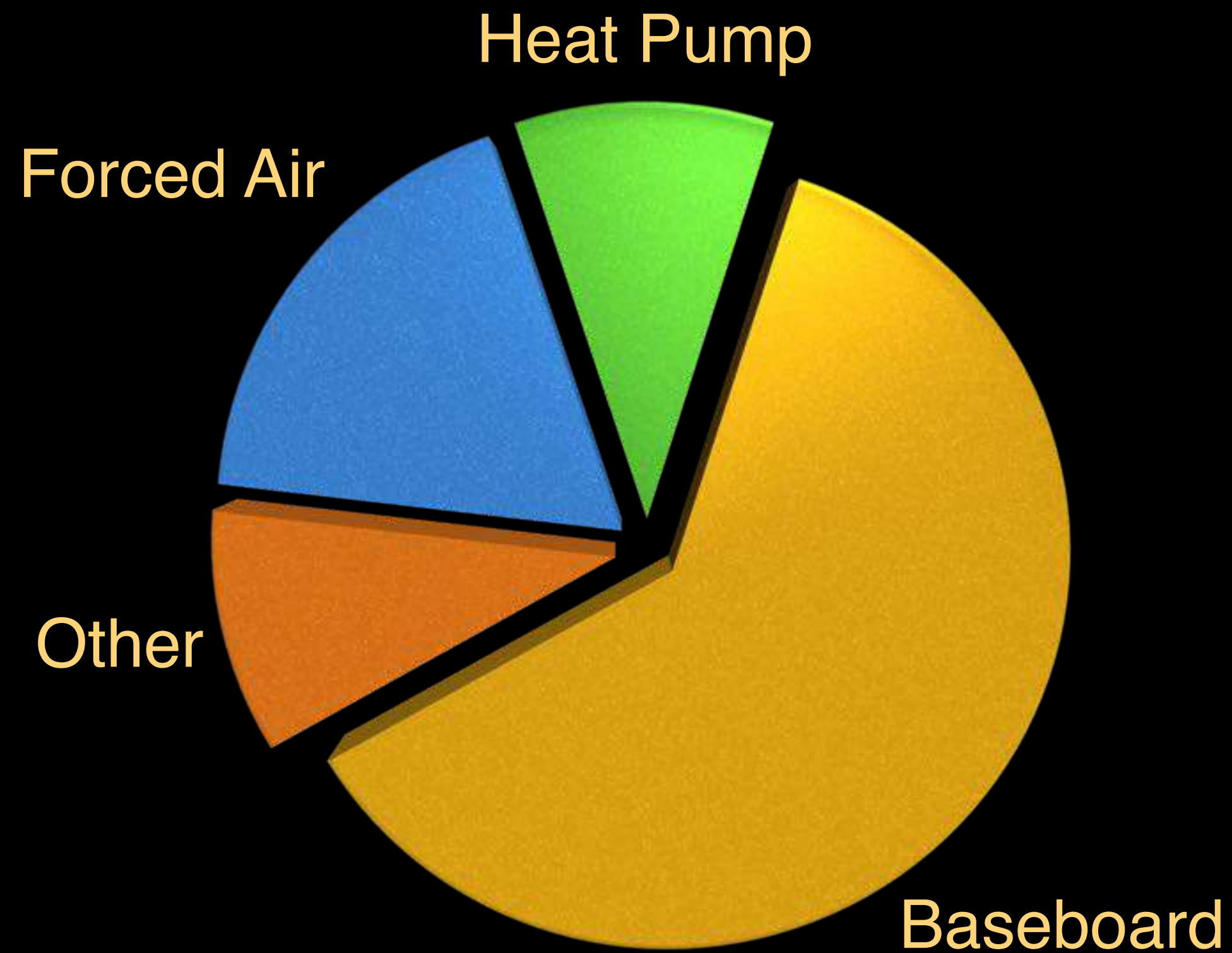
Future



Note: Proportions are representational

# Grid Evolution: Electric Heat Types

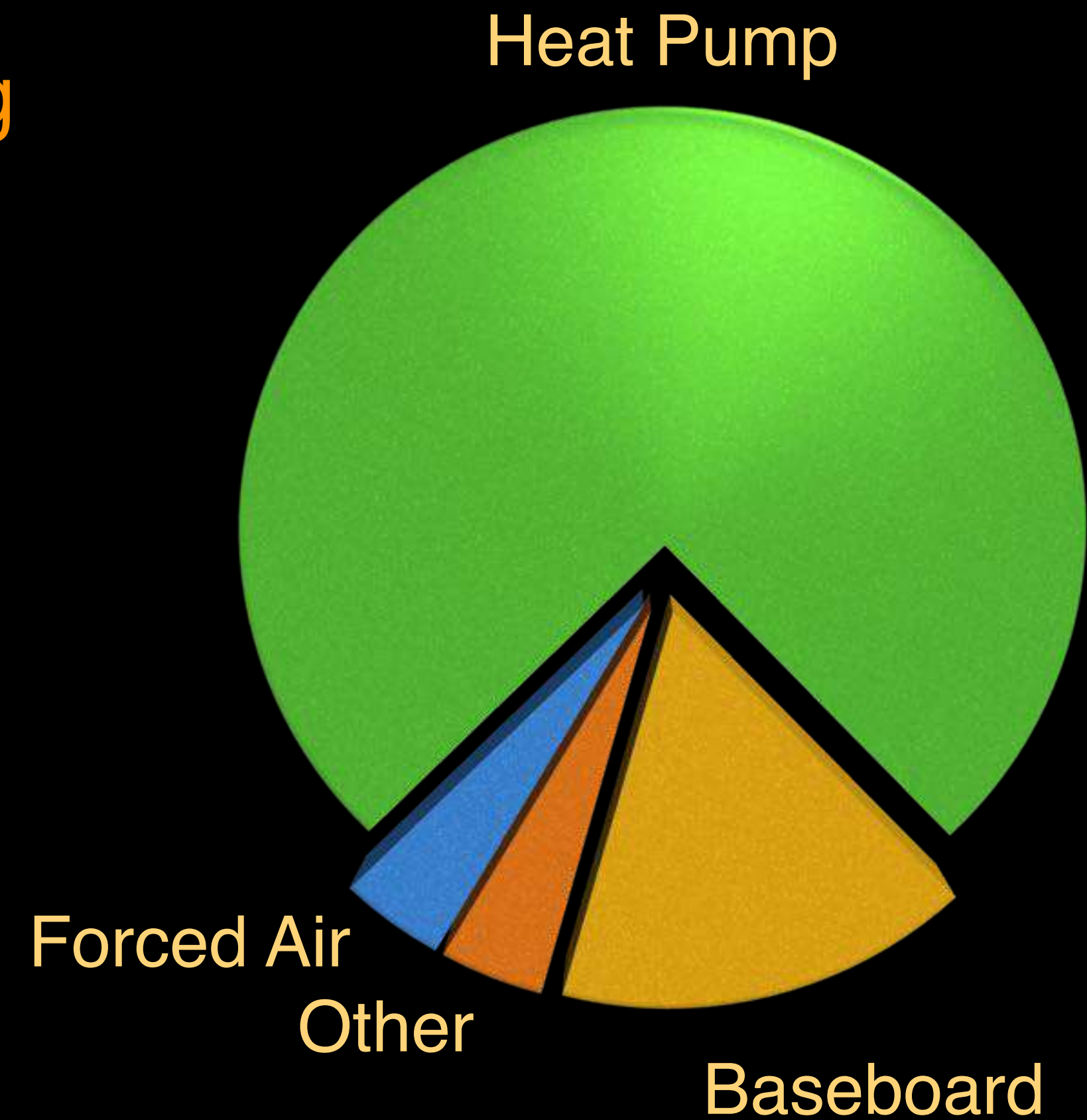
Present



Fuel Switching  
and Energy  
Efficiency  
Initiatives



Future



Note: Proportions are  
representational



# IRP Objectives and Strategy

*typical planning horizon of 20 years*

## Objectives

- **Affordable:** Maintain BPA as our long-term power provider
- **Reliable:** Ensure continuing safe, reliable and stable grid operation as intermittent local renewable energy sources are added
- **Clean:** Minimize environmental impact (reduce carbon footprint)
- **Sustainable:** Increase sustainability for critical services

## Recommended Strategies

- Optimize BPA power (Tier 1)
- Maximize BPA rebates to our membership
- Incentivize fuel switching for EV, heat pumps and new construction
- Ensure grid control backbone accommodates emerging smart grid local distributed energy resources and vehicle-to-grid (V2G) standards
- Encourage peak load reduction (renewable and demand response)
- Continue to evaluate relationships with strategic resource partners
- Establish prepaid metering program
- Continue education and outreach programs (support above)

# IRP Objectives and Strategies

Strategic Objectives		Affordable	Reliable	Clean	Sustainable	Funding Source	Notes
Strategic Initiatives							
Optimize BPA power		✓	✓	✓		rates	Tier 1
GCB supports emerging local renewable energy standards			✓		✓	rates	Ensure grid control backbone accommodates emerging smart grid local distributed energy resources and vehicle-to-grid (V2G) standards
Encourage peak load reduction		✓				rates	Renewable and demand response units
Evaluate strategic resource partnerships		✓	✓	✓	✓	rates	Continue discussions with PNGC, NRU, ...
Establish prepaid metering program		✓				self funding	Explore fee/fees that recoup costs and encourages bulk credits
Incentivize fuel switching		✓		✓	✓	new revenue	For EV, heat pumps and new construction
Maximize BPA rebates		✓			✓	EEI	To our membership, use BPA funds to target BPA programs
EE&C, rebates - self funding		✓			✓	bill rider	Target non-BPA incentives such as fuel switching - e.g. propane to heat pump, ...
Continue education and outreach programs		✓				bill rider	In support of all other programs
Revenue stability (revenue recovery add-on)			✓		✓	bill rider	Ensure high level of reliability and customer service
Community Solar				✓	✓	bill rider, WA, fed	Reduce cost through economy of scale at grid optimal locations
Low Income		✓				bill rider	Implement support program in alignment with needs assessment
PAL		✓				member donations	Implement support program in alignment with needs assessment
LIHEAP (Low Income Home Energy Assistance Program)		✓				federal	In partnership with low income family services
Rock Island home and business internet		✓	✓	✓	✓	subscriber	Short-term investment through rates, dividend starting in 2021 reduces costs and increases margin

# IRP Next Steps

- A. ✓ Complete Staff kick-off meeting: November
- B. ✓ Development of Load forecast scenarios: Q1
- C. ✓ Development of BPA Power Supply modeling: Q1
- D. ✓ Present Load-Resource Balance and scenarios to Board: Q2
- E. ✓ Research resource and efficiency options applicable to OPALCO: Q2
- F. ✓ Evaluate strategic alliances with other utilities: Q2
- G. ✓ Present Recommended Strategies: Q3 (August Meeting)
- H. ✓ Develop benefit/cost analysis of identified resource and efficiency options: Q3
- I. ✓ Develop risk analysis: Q3
- J. ✓ Solidify direction: Q3
- K. Draft Report: Q4
- L. Present Evaluation results and strategic options for the future: Q4
- M. Present Analysis of strategic alliances: Q4
- N. Finalize Report: Q4



*Thank You*