



U.S. Department of Energy

Office of Electricity Delivery and Energy Reliability

Hawaii Clean Energy Initiative Regulatory Training Intro April 21/22, 2008

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HCEI Goals

Comments from

- Governor Linda Lingle
- Kevin Kolevar (DOE)

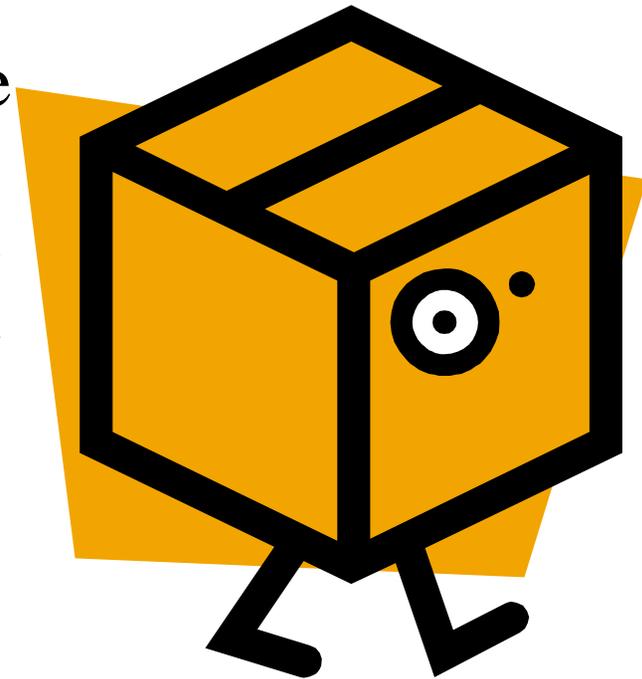
“To engage all parties in Hawaii in creating a path to a sustainable, flexible, and economically vibrant State that uses clean energy resources to supply 70% or more of its energy needs by 2030, and to serve as an integrated model for the United States and island communities globally.”





Why we're here -- Look outside the box

- Gain perspective on current conditions and what may lie ahead
- To help identify sustainable energy solutions for Hawaii
- To help define the future path of electric sector in Hawaii and how to make it happen
- To begin development of a clean energy work plan



What we know

- Hawaii is unique
 - As island system most inputs for energy can be accurately measured
 - Objectives can be clearly defined and should be (mostly) measurable
- Current economic conditions mark a departure point, but not necessarily a constraint
- Our discussion should be unconstrained by the existing institutional or regulatory framework



Overview (1)

TODAY

1. What is the HCEI?
2. What could the future look like if HCEI succeeds?
3. How do various players need to act to achieve these futures?
4. How can we use policy and regulation to support those behaviors?
5. The dog's breakfast -- various issues about policy and regulation



Overview (2)

DAY 2

- Utility regulatory math
- Incentives and disincentives
- Decoupling revenues from sales
- Demand-side resource business models

DAY 3

- Renewable and clean resources
- Resource planning
- Integration and other services
- Rates

FRIDAY WORKSHOP

- Put it all together
- Where do we go from here, substantively and procedurally?





Caveats and expectations

1. This week, we're only talking about electricity (mostly), natural gas (by implication) and their end uses.
2. We're mostly talking regulation, but we'll be asking for and collecting ideas for complementary policy changes that lie outside the Commission's current responsibilities.
3. Our challenge is not merely to help you think outside the box, but to erase the box completely.
4. We (the trainers) don't know as much as you do about Hawaii, so we apologize in advance if we say under-informed things -- please correct us (politely if possible).
5. These will be structured discussions, not lectures. You have to work too....

Goals & Concerns





Benefits from the HCEI

- Lower, more stable energy prices
- Lower energy bills over the longer term
- Less import vulnerability
- Increased energy security (from more local production)
- Lower risk from more diverse portfolio of energy sources
- Lower environmental and carbon cost exposure
- Lower GHG emissions
- More clean-tech, well-paying jobs
- More of HI money spent on energy stays in the islands' economy
- State leadership, innovation and accomplishment



Big questions for our dialogue

- What are your explicit goals?
 - Less fossil
 - Diverse fuel mix
 - Energy independence
 - Energy cost levels and volatility
 - Carbon content
 - What else?
- How can you tell when you've reached success?
- What paths are available to reach these goals?
- What institutional and regulatory changes are necessary to reach these goals?
- To what extent does success depend on coordination with other institutions or stakeholders?



HCEI Vision -- the details

1) 70% of Hawaii's energy use -- which uses?

Total HI energy use = 333.4 trillion Btu (2005)

- Electricity + natural gas 35%
- Ground, marine transportation 24%
- Jet fuel 28%
- Direct industrial use 13%

(per EIA 2005 State Energy Data tables)

HCEI plan for now

- look at electric, industrial and non-jet transportation
- assume we need to get 70% (or more) out of those sectors
- tackle air transport fuels later



HCEI Vision -- the details

2) What's the baseline for the 70% reduction?

Baseline = energy use under business as usual (BAU) conditions, projected out to 2030.

- These calculations are under way now.
- By 2030, use 70% less than the original BAU projection.

Who's calculating the baseline? Will it get re-calibrated over time? TBD...



HCEI Vision -- the details

3) What's clean energy*?

- Energy saved (conservation)
- Energy used more efficiently (by end-use efficiency and energy system efficiency improvements in generation and delivery; substitution of gas for electricity?)
- New renewables
- Fossil uses converted to renewables (e.g., biofuels) or renewables substituted for fossil (e.g., solar hot water heating)

How do you measure clean energy over 22 years?

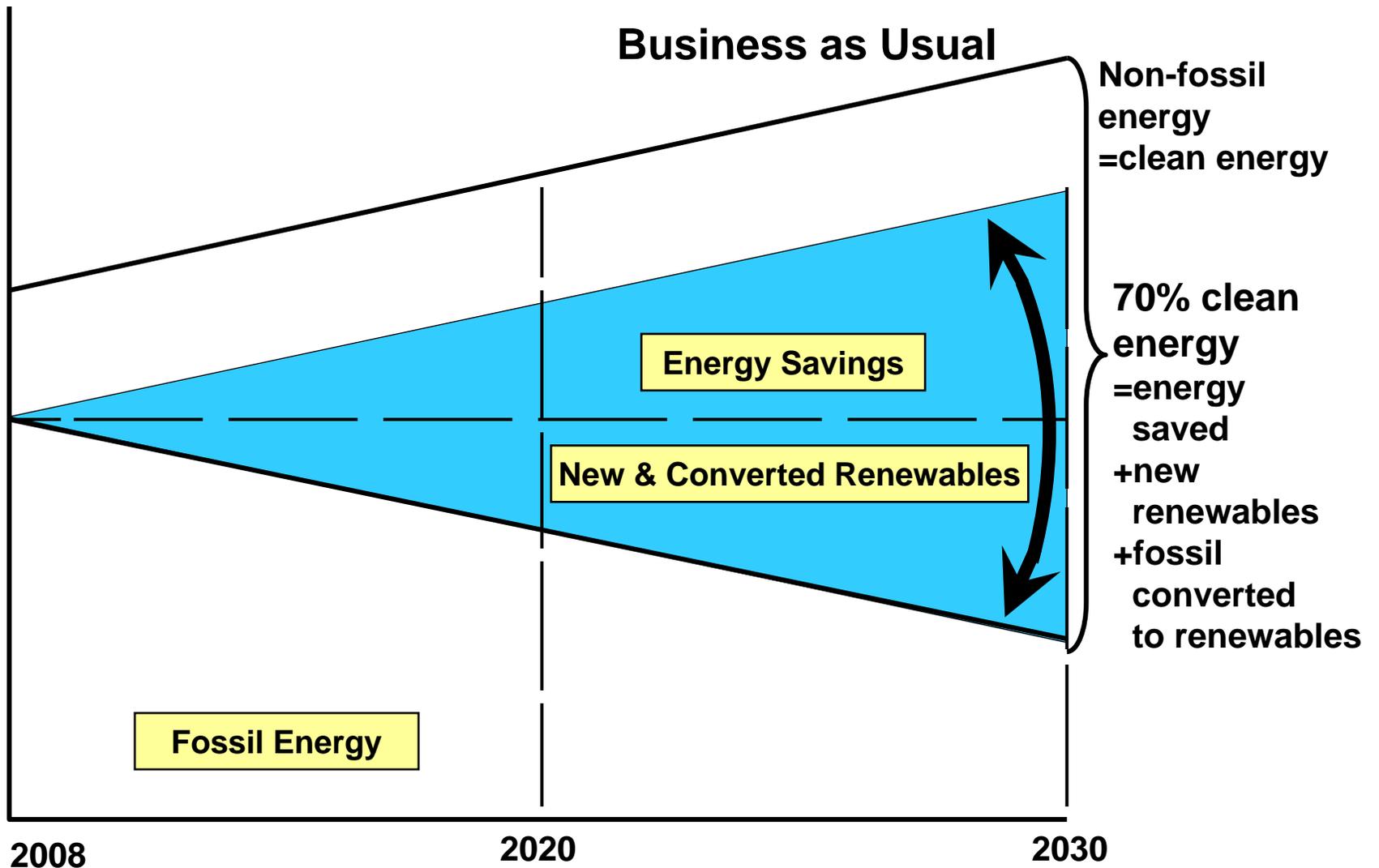
- MMBtu from renewable sources, kWh not consumed, ...?

* do we need to define “clean”?

HAWAII CLEAN ENERGY INITIATIVE

Broad Options For Future Clean Energy

ENERGY



So what's this going to look like?

It depends

- On technology availability and costs over time
- On oil prices
- On Hawaii's needs and preferences
- On markets, business conditions and financing options
- On state policy and regulatory choices and execution
- On federal and international policy choices (e.g., GHG)



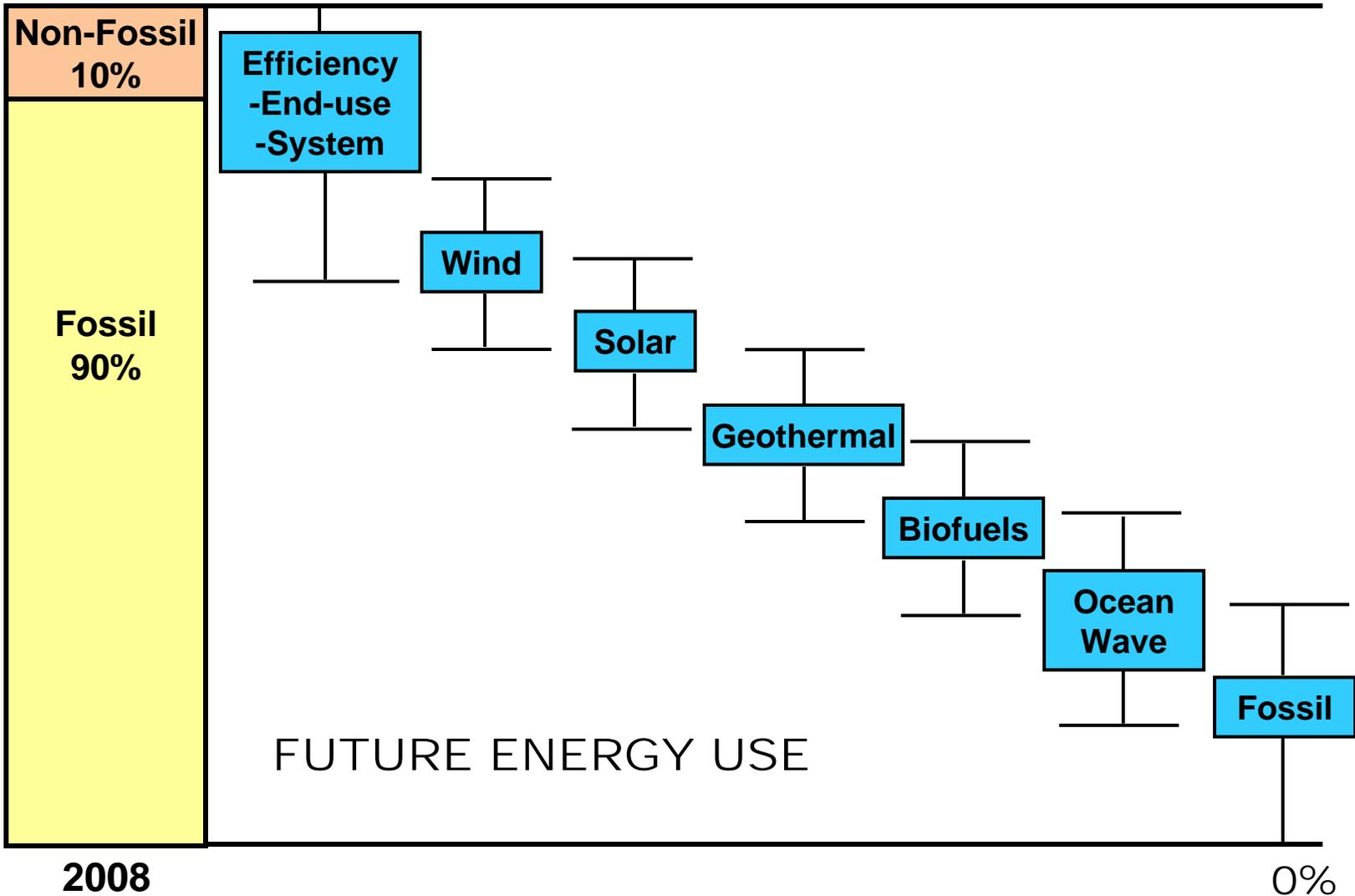
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Envisioning Energy Options

Today

2030

100%



FUTURE ENERGY USE

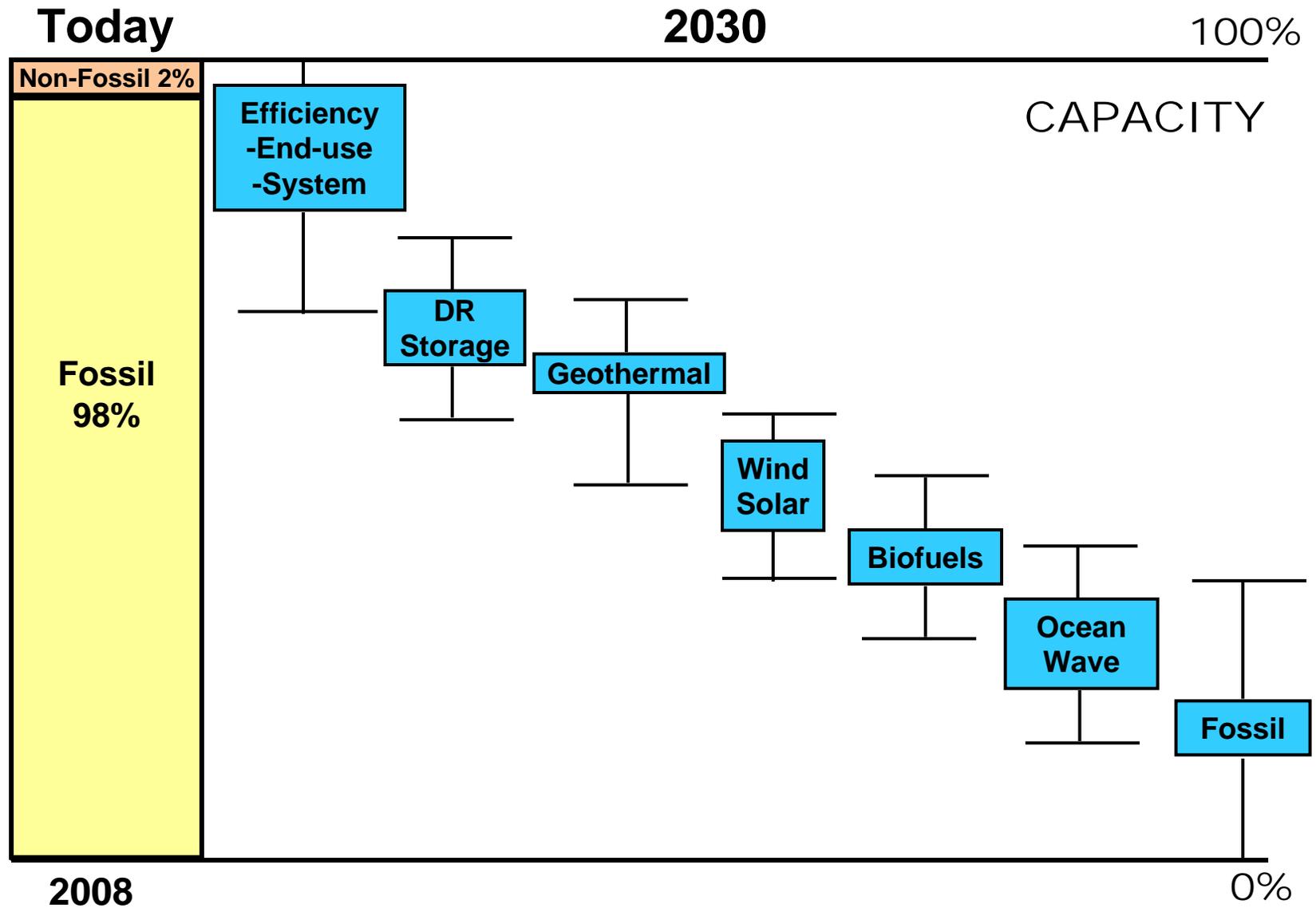
2008

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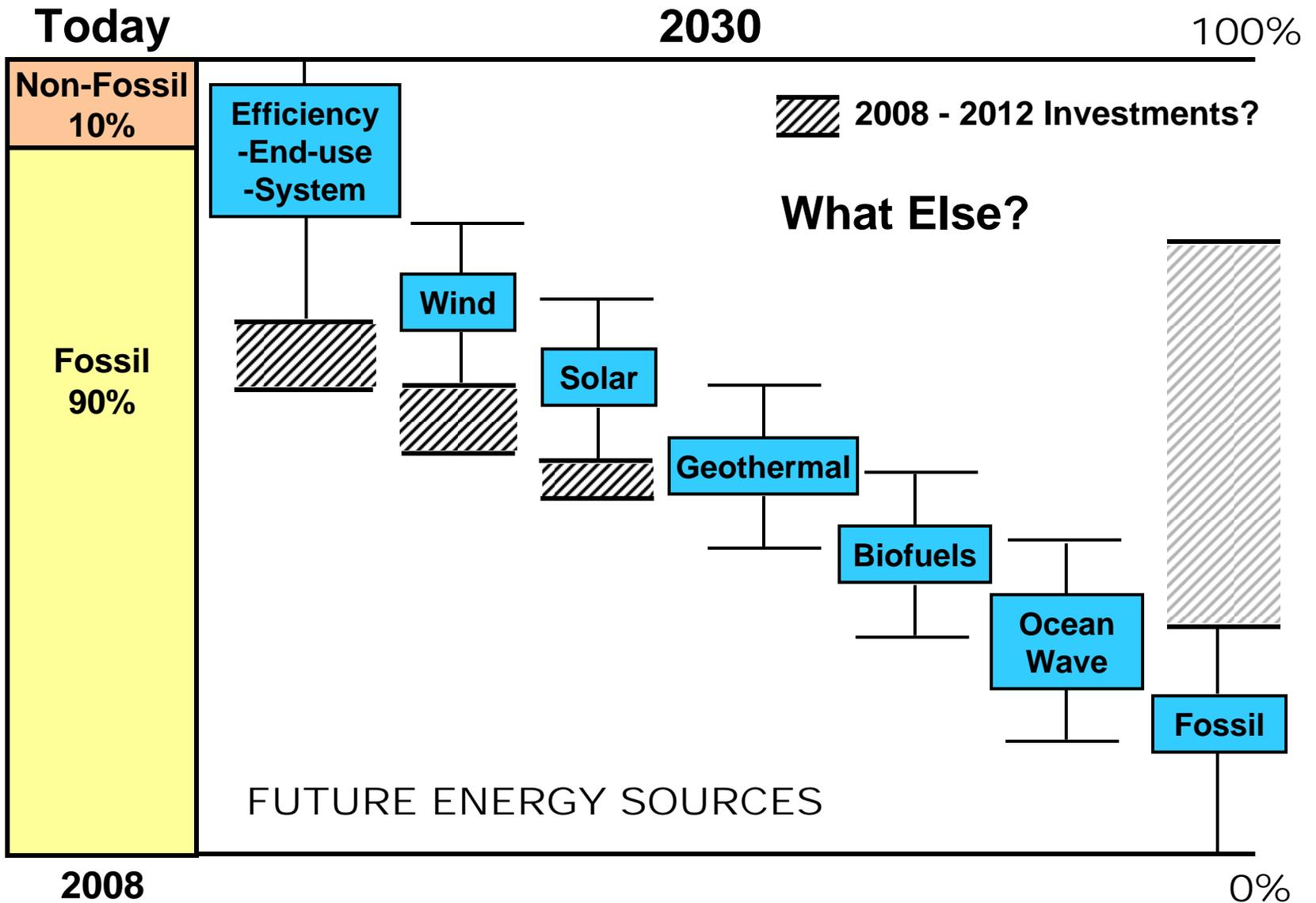
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Envisioning Capacity Options



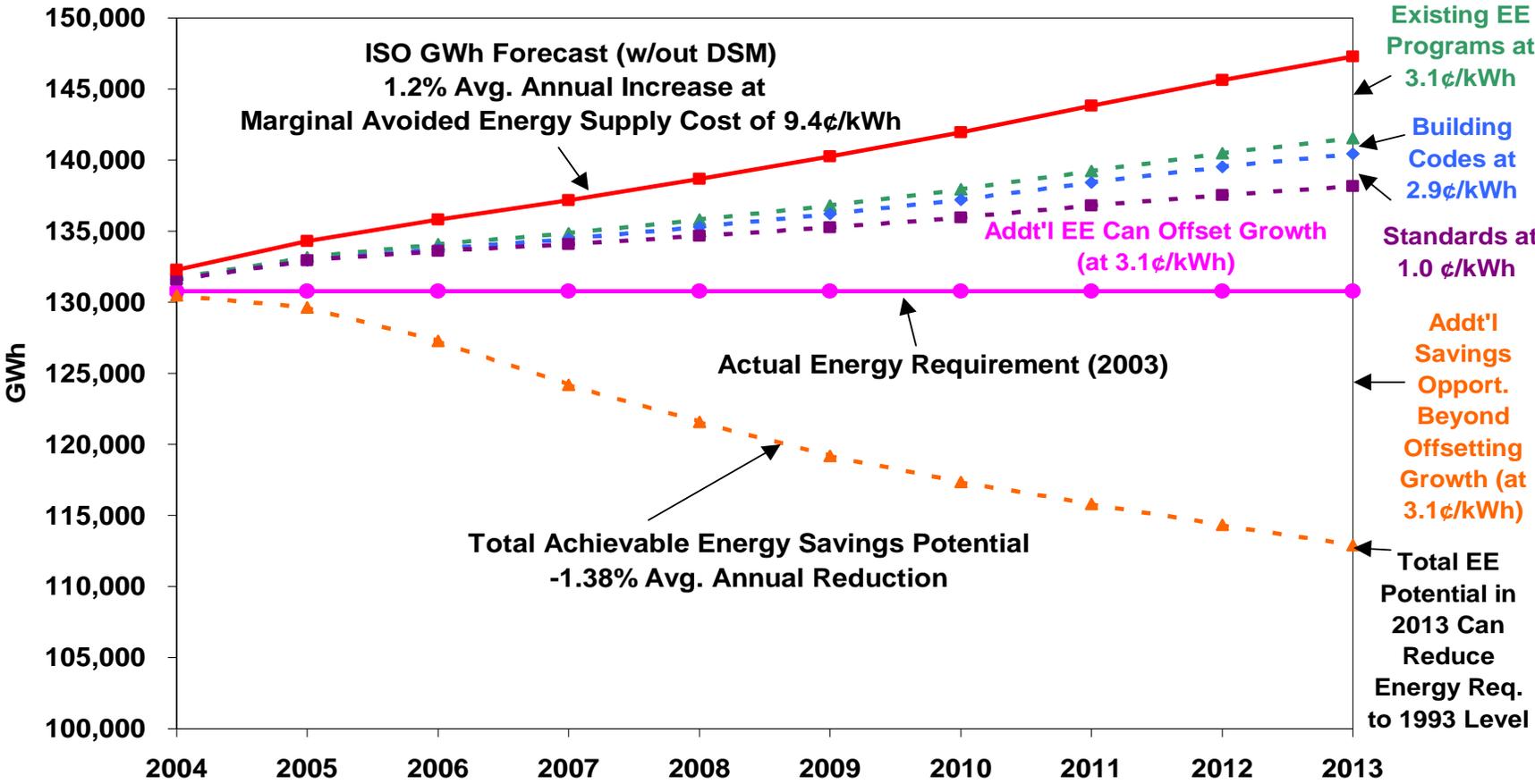
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Looking For Early Wins – Making Early Choices



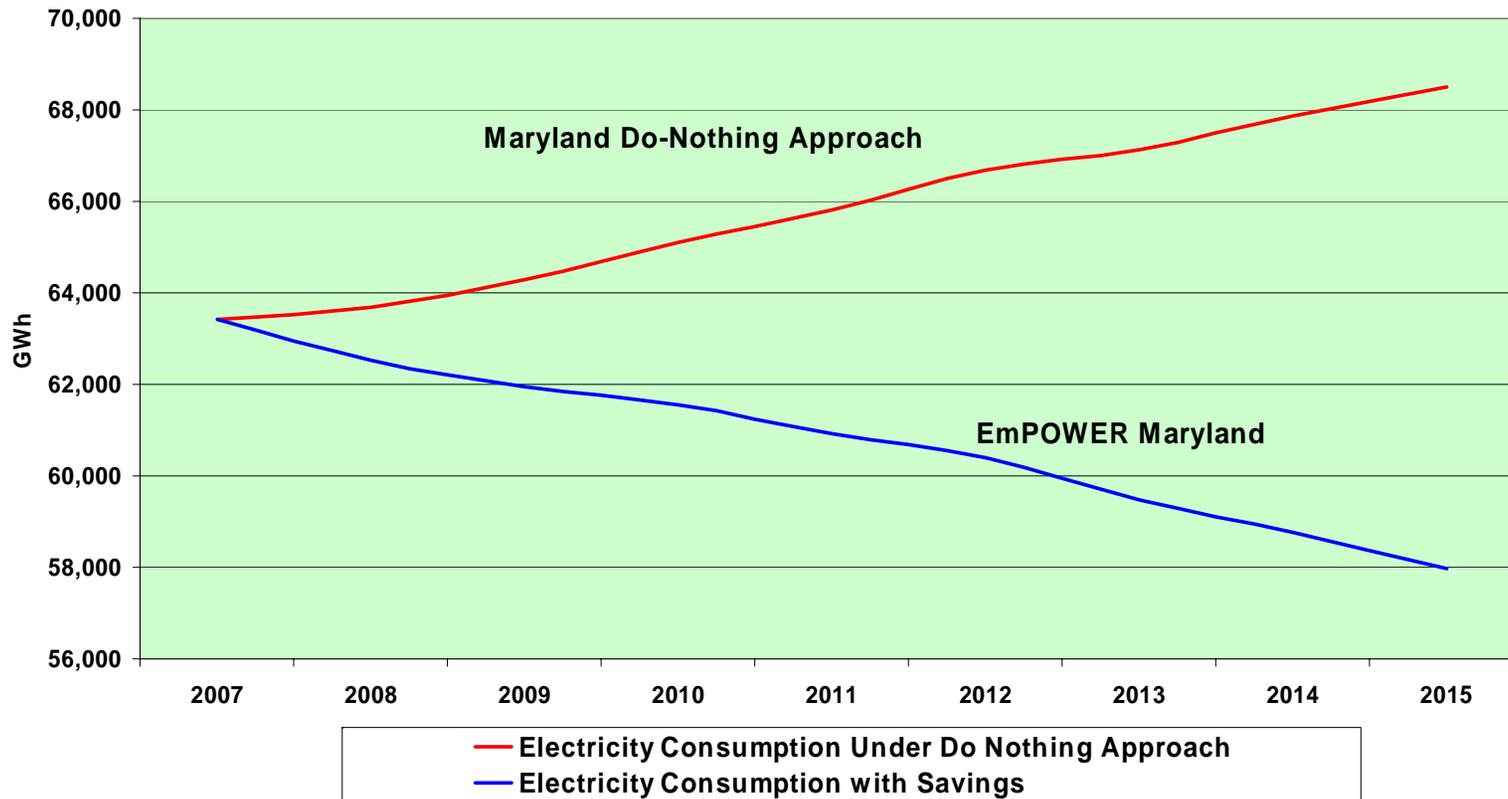
Perspective -- New England, 2004

Existing and New EE Strategies Can Offset ISO Forecasted Energy Requirements (GWh) and Beyond



Northeast Energy Efficiency Partnership, Economically Achievable Energy Efficiency Potential in New England, Spring 2005

Perspective -- Maryland, 2008



ACEEE EE and DR potential study found that a suite of aggressive EE and DR policies (including an EERS) could deliver a 15% reduction of GWh used by 2015 and 29% savings by 2025, cost-effectively, relative to the BAU case. This would cut electric bills for every customer and stabilize regional electricity prices. (ACEEE 2008, Maryland Energy Administration, 3/08)

Goals and metrics

If it's doing, it's worth expressing clearly and measuring accurately. What are the right performance goals and metrics for the HCEI?

- For the state
- For the utilities
- For others
- Near-term v. long-term



Thoughts on performance goals & metrics?

For the state



Performance goals & metrics? (2)

For the utilities



Performance goals & metrics? (3)

For others



Digression -- Tradeoffs

- 1) Do all these goals work together?
- 2) How could they conflict?
 - Cost and rates
 - Total energy costs and bills
 - Intermittent resources and grid operation
 - Reliability
 - Cultural and environmental protection
 - Siting new facilities
 - Other?
- 3) Will you be prioritizing the goals? How do they stack up?
- 4) When they conflict, how should you resolve it?





How do various players need to act to achieve these futures?

If we can't dictate specific actions and investments, what general actions and attitudes do we want from each set of players to move HI toward the 70% clean energy outcome?

For:

- Utilities (toward efficiency, DG, smart meters, DR, smart grid, fossil IPPs, renewable IPPs, natural gas substitution, PHEVs, ...?)
- Generation suppliers and investors
- End users and end-use equipment vendors (toward DG, DR, efficiency, new buildings, retrofits, substitutions)?
- Energy efficiency administrator and providers

How do various players need to act to achieve these futures?

Utilities



How do various players need to act to achieve these futures?

End-users





How do various players need to act to achieve these futures?

Efficiency administrator and providers

Should the utilities be allowed to deliver EE?



How do various players need to act to achieve these futures?

Generators

- Who are they?



How do various players need to act to achieve these futures?

Others? (Who and what/how?)

How do we get there from here?

What policies and rules do we need to support those behaviors? (big picture for now)



The dog's breakfast

Miscellaneous relevant issues

- Who pays for the HCEI?
- Cautions re changing regulation
- Risks
- Risk management options
- Financing options for new assets
- Utility cost recovery mechanisms
- Rate options



Who pays for the HCEI?

Everyone -- ratepayers, taxpayers, shareholders, breathers, in- and out-of state, etc.

The proper question is, **what's the most economical, effective and cost-effective way to structure payment for each task or element that will get that part done in a good way at the right time?**





Who pays for the HCEI? (2)

Ways to collect and distribute money for HCEI elements

1) Personal choices

- End-users through expenditures on building and appliance improvements and DG
- End-users, through other systems' or measures' failure to perform adequately (power outages, traffic congestion, dirty air, higher-than-necessary utility bills, uncomfortable buildings, inefficient manufacturing, rising sea levels, ...)
- Private investment (R&D, investments at risk of non-recovery)

2) State policy, statute, and regulatory directive

- Utility rates
- System benefit funds (still ratepayer money)
- Taxpayer subsidies (state and federal tax incentives and credits, government loan guarantees, revolving loan funds)
- RPS, RECs, green and white certificates, penalty payments



Cautions re changing regulation

What does Wall Street (and investors generally) want?

- Policy and regulatory predictability and stability
- A clear vision and explanation of why it's changing, whether the commitment will hold, and why it will work
- A clear path to cost recovery
- A strong chance to earn a reasonable level of profits
- Foreseeable, understandable, and manageable risks

If these things don't happen?

- Lower credit ratings for affected utilities and IPPs
- Higher costs of debt and lower willingness to lend (no matter how deserving the investment)
- Less capital investment in states with less rational regulation and policy (utility and IPP)
- Higher utility energy costs and rates (that rate freezes don't cure)

Risks today

What risks do HI and the utilities and generators face today given current energy use patterns?

- Costs of fuels and energy (commodity and portfolio risk)
- Technology risk (esp. eqpt performance risk)
- Energy and fuel security
- Spark-spread (costs of one fuel relative to another)
- Equipment and construction cost escalation and delays
- Economy and load risk (linked to demographics)
- Catastrophe (aka event) risk
- Credit risk and limited access to capital
- Evolving environmental standards and carbon compliance risk
- Legal risk
- Regulatory (esp. cost recovery) risk
- Political risk
- Technology obsolescence and disruptive technology



Thoughts on risks tomorrow?

What risks could the HCEI create, exacerbate or mitigate?





Risk management options

- Portfolio construction for diversity
 - Multiple fuels, technologies, etc
 - Mix of contract terms and sizes with performance guarantees
 - Mix of ownership
- Solid resource planning process (transparent, inclusive, analytical)
- Financial hedging (derivatives, swaps, futures)
- Insurance (self- and third-party)
- Partnering or consolidation
- Vertical integration of key functions
- Outsourcing or selling non-core functions
- Debt reduction
- Timely recovery of expenses and investments



Financing options for new assets

- Traditional utility debt and equity (esp. mortgage linked to asset)
- IPP financing and PPA with utility (which shows up on utility's balance sheet as debt equivalent)
- Securitization or utility tariff bond locked to asset-dedicated tariff or surcharge
- Government-backed loan guarantee for utility borrowing to finance asset
- State bond authority finances asset, leases to utility
- Private entity finances asset, leases to utility or customer (e.g., new PV or DG)
- Customers pay (e.g., Pay as You Save)
- Partnering with other owners (utilities or private)
- Federal funding (e.g., R&D grants)



Utility cost recovery mechanisms

Goal -- subject to findings that investments and actions were prudent, increase certainty and speed of cost recovery

- Single-issue rate case
- Pre-certification of need and/or pre-approval of cost recovery (usually within specified limits)
- Energy cost adjustment clause
- Single-issue cost tracker with later recovery
Construction work in progress
- Expensing pre-commercial operations costs
- Ratebasing costs annually by formula, followed by regular prudence true-ups
- Formula-based ratemaking (as for performance-based rates)
- Others?

Rates math intro

Revenue requirement =

Variable costs (incl fuel)

+ Return of invested capital (aka rate base)

+ Return on rate base (aka return on equity)

Rates = f(revenue requirement, kWh sales, kW)

allocated in ways that bear some relation to cost causation and achieve social objectives such as affordability and price signals.*

Profit -- Utilities get an opportunity to earn a profit if actual revenues exceed costs, but no guarantee.

* What subsidies do you have embedded in rates today? Will they make sense under the Clean Energy Initiative?



What's next?

Agenda

- Day 2 -- Utility incentives
- Day 3 -- Clean resources -- efficiency and renewables
- Friday -- Conclusions and planning

Don't forget to think about:

- What can best be done by utilities and what has to be done by other means?
- Don't try to make one piece perfect, look for ways to integrate many pretty-good pieces into an effective HCEI whole
- System optimization...?

