Hawai‘i’s Energy Transition and the Distributed Generation Model

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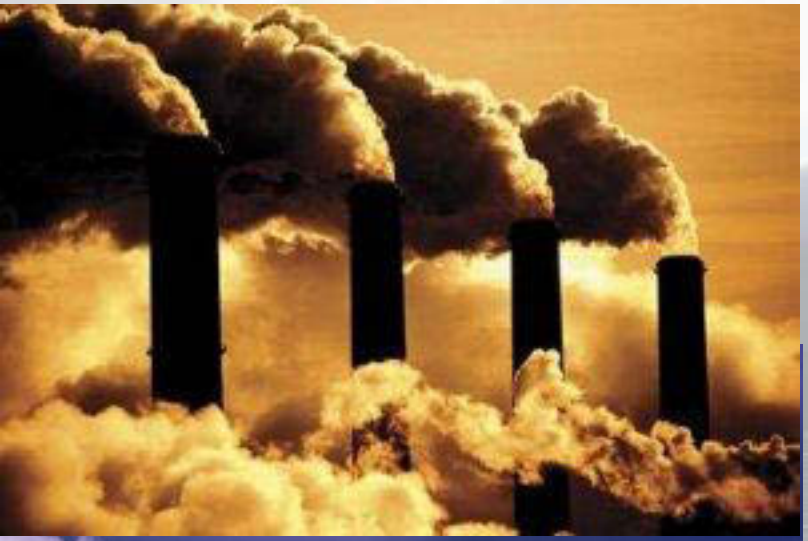
Mark Duda
President, Hawai‘i Solar Energy Association
808.735.1467

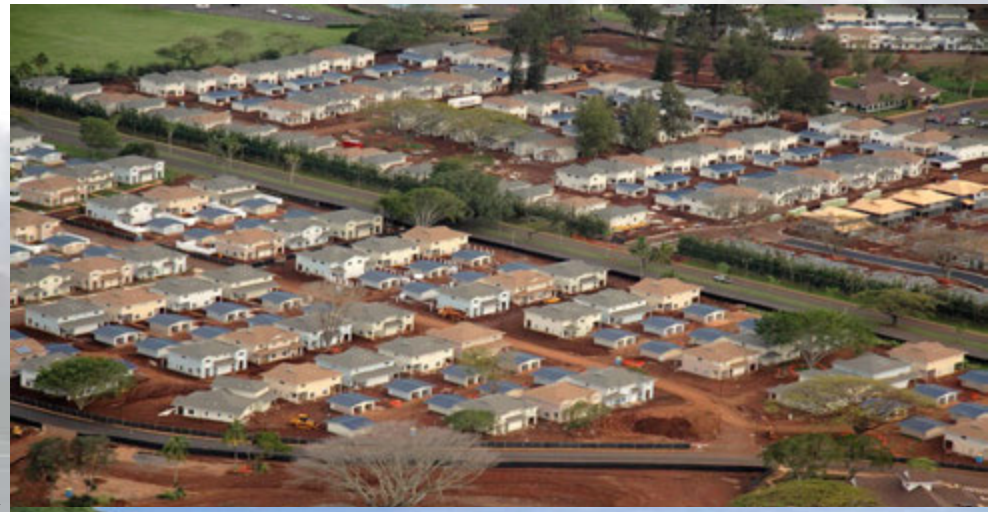
Energy Transition

Part 1: Fossil to Renewable



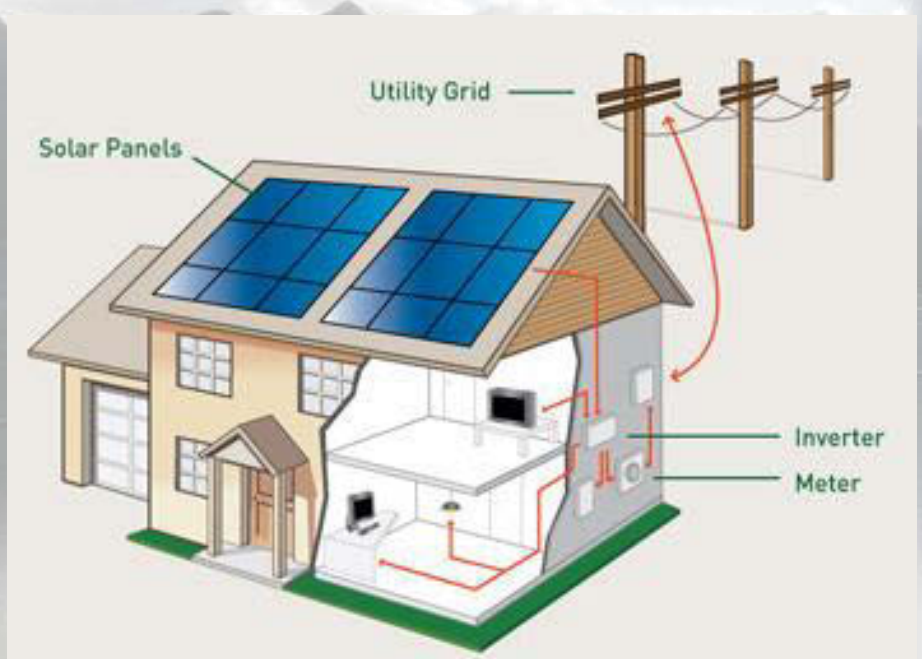
Energy Transition

Part 2: Centralized to Distributed



Energy Transition

Part 3: Contemporaneous Use → Storage



Drivers of the Transition

- Resource scarcity/quasi-scarcity/perceived scarcity
- National security concerns
- Public policy
- Technological change
- Economics

General Transition Period Dynamics

- Making social choices under uncertainty is difficult
- Desire not to be wrong supports status quo
- Politics are amplified by uncertainty
- Infrastructure lock-in concerns are real
  - Example 1: Urban development patterns - China
  - Example 2: Architecture/building standards – Buffalo
  - Example 3: Smart grid technology

Hawai‘i’s Specific Context

- Renewable resource endowment is world class
- Capital poor environment/small market
- Limited ability to drive global R&D – must accept innovation driven by conditions elsewhere
- Government has limited resources
- Energy security situation is absurd
- Reliance on tourism → jet fuel
- Antiquated utility infrastructure
- Auto dependent

Some Implications for Hawai‘i as We Look Ahead

- Locally produced energy sources are better
- Non-fuel technologies are better
- Need to use technologies not developed for HI
- We must anticipate affordable/available storage
- There is a one off opportunity to extract maximum ancillary benefits from transition
- Avoid orphaning infrastructure
- Recognize regulatory mismatch between status quo and what we will need in the future system

Some Aspects of a Distributed Model

- Aggressively promote/require/incentivize conservation/efficiency
- Support true offsets such as solar water heating
- Accelerate smart grid ‘intra-structure’ deployment
- Adjust laws/rules to allow optimal generation combination
- Encourage micro-grids
- Make power where it is used

Why DG Makes Sense

- Long term solution to energy problems
- Marshalls substantial private investment
- Creates sustainable employment
- Multiplier effects of construction are high
- Hedge value (all non-fuel technologies)
- Investment capital channeled to HI-based businesses
- Disposable income increased for HI homeowners

How Will We Get There

Stop Making the Problem Harder to Solve

- Energy efficient building codes
- Energy efficient product floor
- Aggressive HVAC retrofit effort
- Auto fuel standards floor

Identify unmet needs

- Residential finance (Malama Loan, PACE)
- Commercial loan guarantees

Avoid Obvious Mistakes

- No new fossil based generation

Take Advantage of Resources We Have

Regulatory Revolution

- Create the system we want and then regulate it

De-Link Energy Costs from Fuel Costs

- Residential finance (Malama Loan, PACE)
- Commercial loan guarantees

Acknowledge that delay is no longer an option

Thank You