

Understanding Hawaii's Solar PV Market

Pacific Coast Electrical Association Conference
“Partnering for Change”
Honolulu, HI

October 7, 2009
2:45-3:05

Mark Duda
President, Hawaii Solar Energy Association
PO Box 37070
Honolulu HI, 96837
808-735-1467
www.hsea.org
mark@dephawaii.com



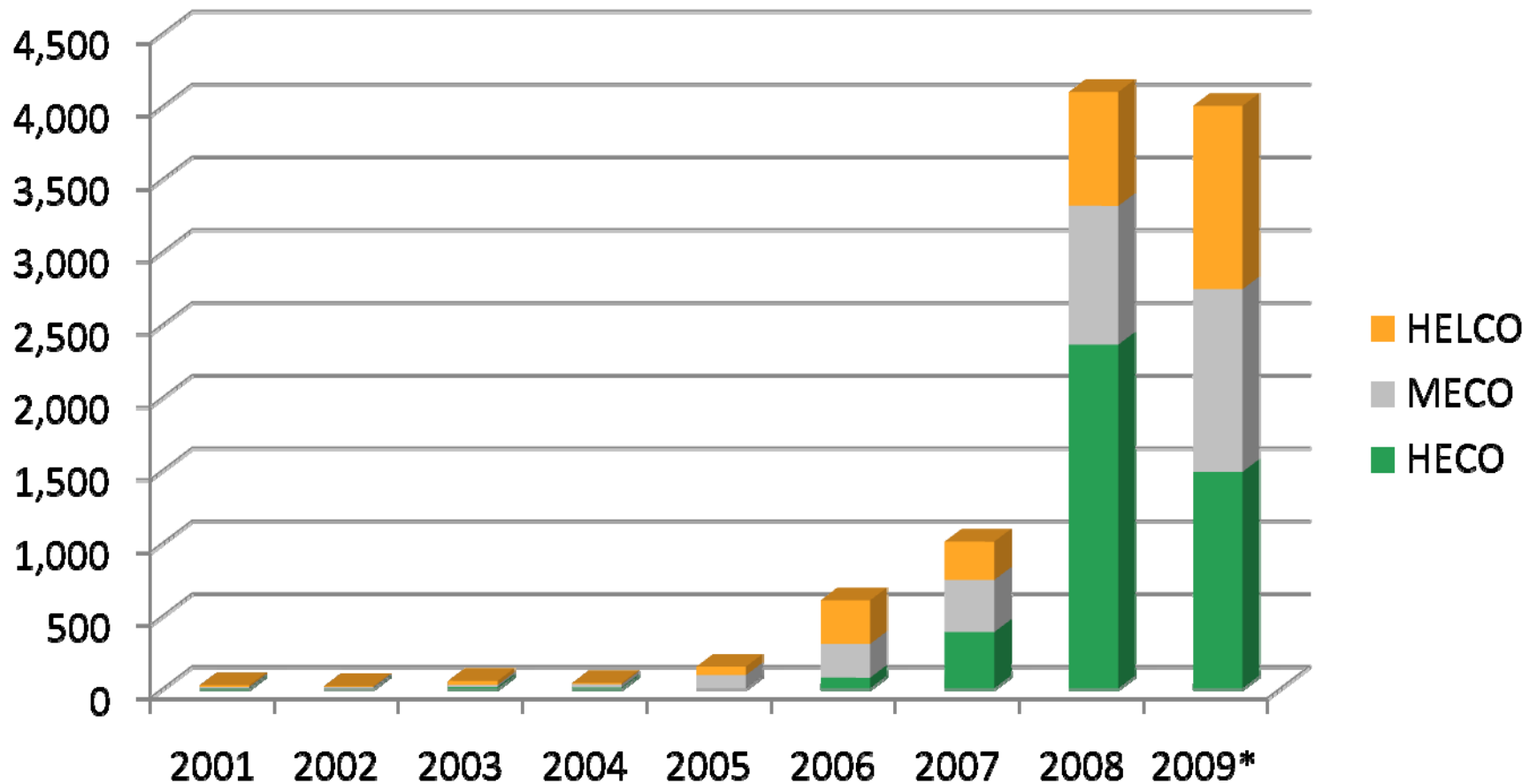
Hawaii Solar Energy Association
Strong Hawaii Since 1977

Section 1

OVERVIEW

PV Growing Even in Downturn

kW, net metered systems only



*Through August 31, 2009

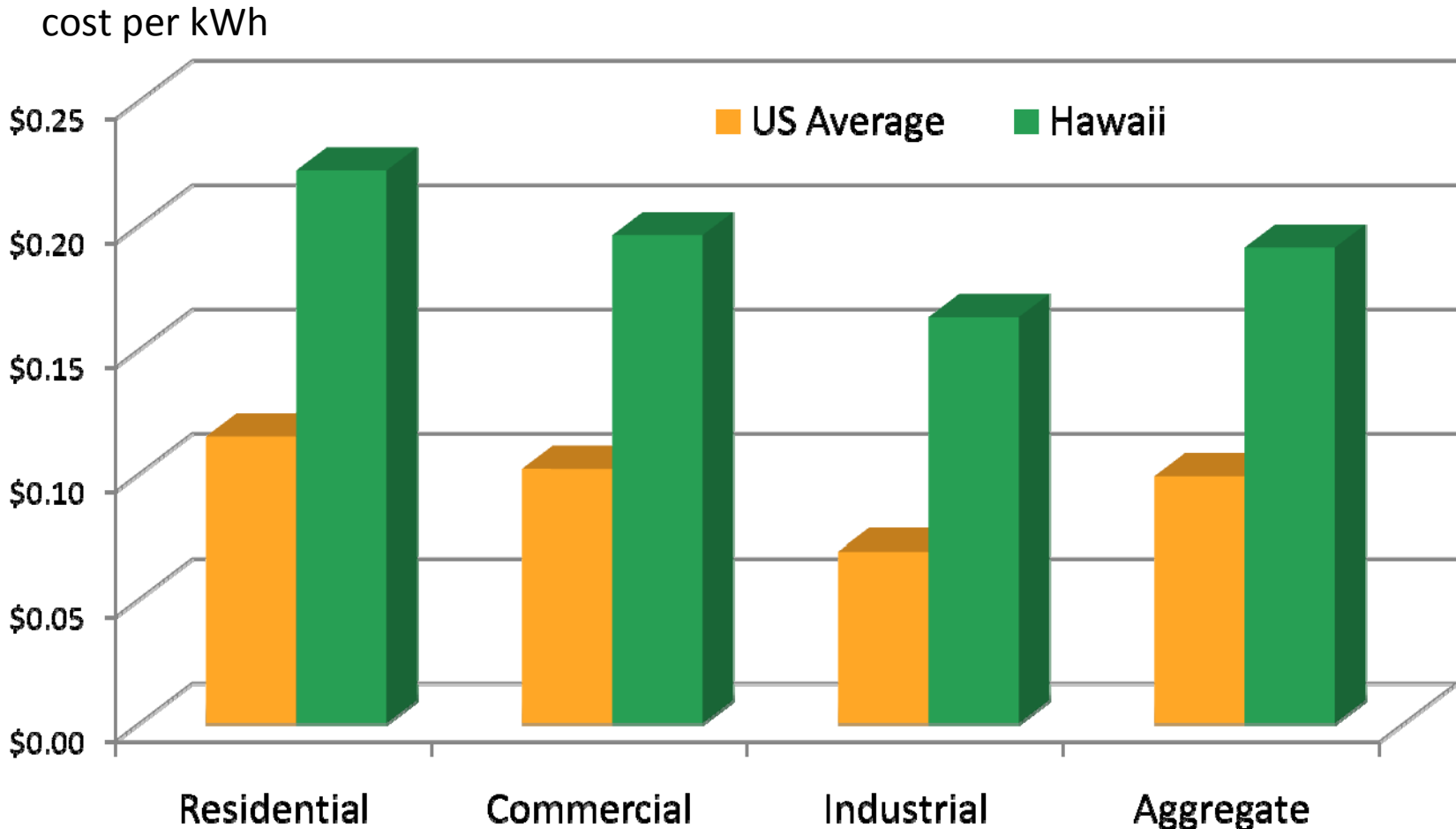
Source: HECO Companies.

Key Policy Drivers

- *Emergency Economic Stabilization Act of 2008* (“**Bailout Bill**” – October 2008)
 - extended solar investment tax credit to 2016
 - eliminated \$2,000 residential cap
- *American Reinvestment & Act of 2009* (“**Stimulus Bill**” – February 2009)
 - made credit into a grant 2009-2010; 60 day payout
 - allows 50% ‘bonus depreciation’ for projects placed in service in 2009
- *Hawaii Act 154 (2009)*
 - Makes refundability of RETITC at 24.5% an option

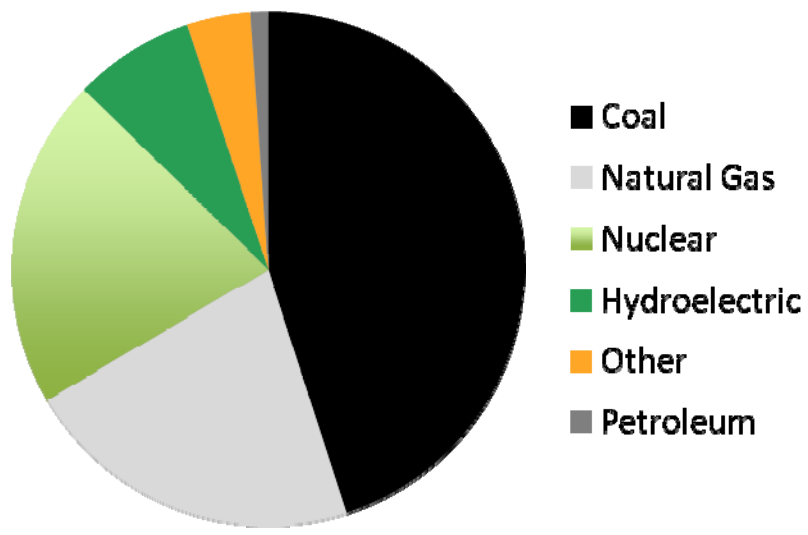


Grid Power is Expensive in Hawaii

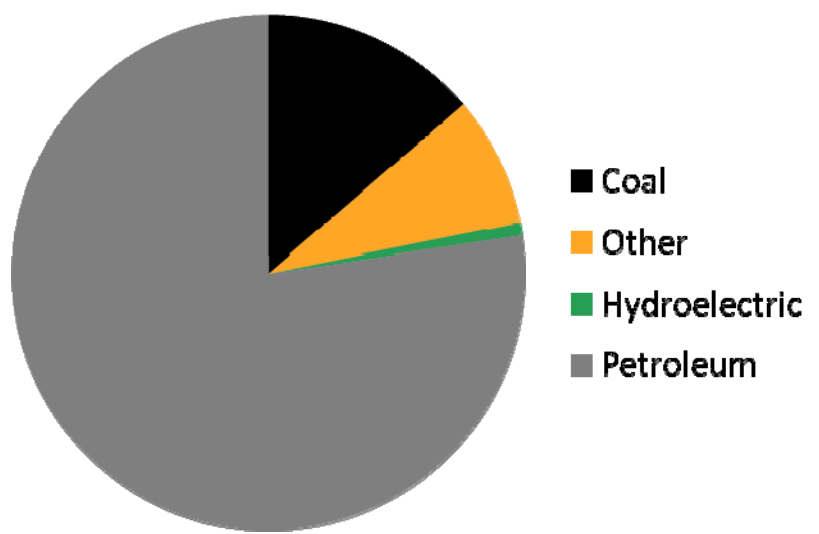


Energy Security is Important to Hawaii Businesses

US



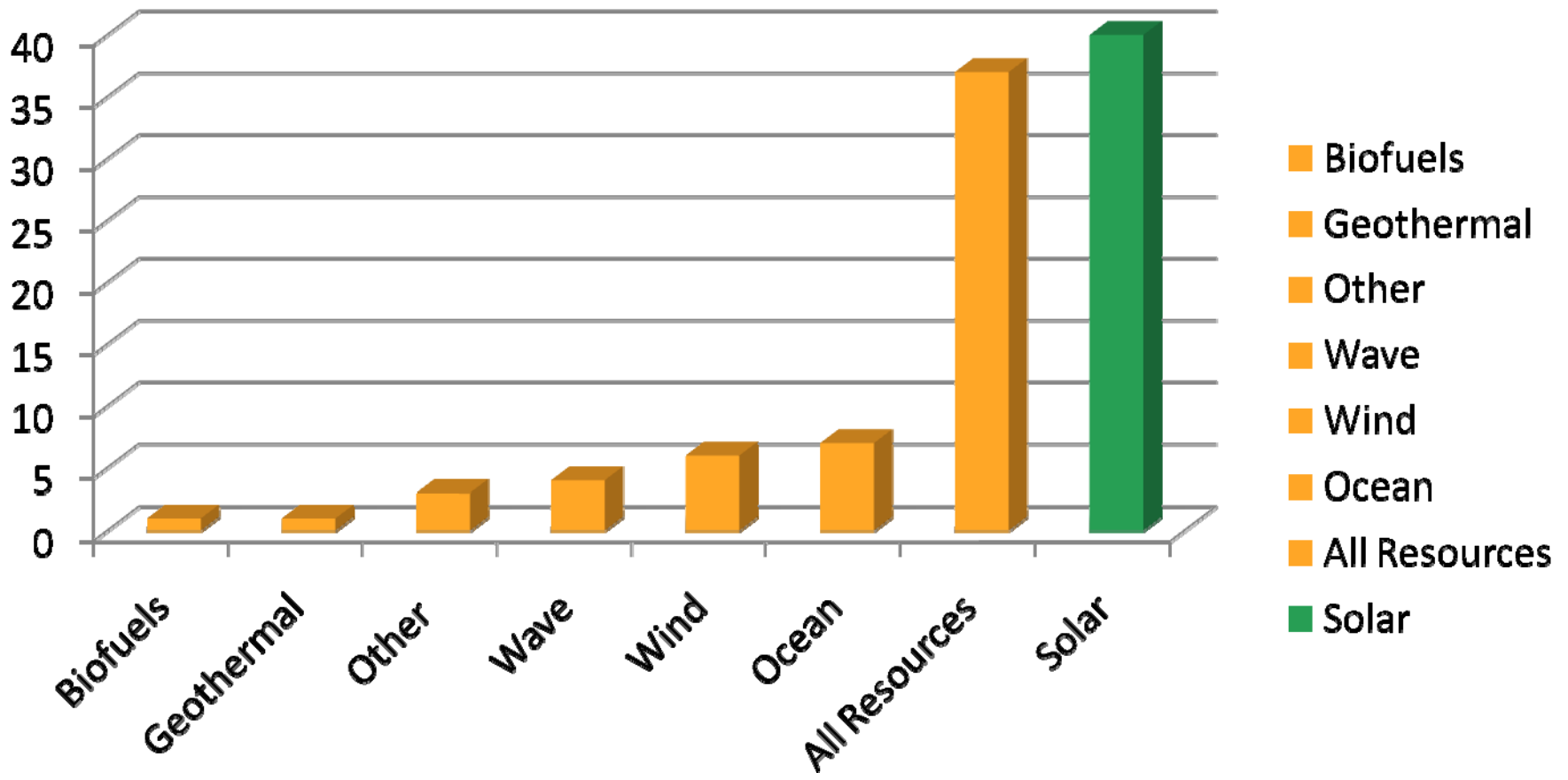
HI



Source: USDOE Energy Information Administration, Electric Power Industry Generation by Primary Source (as of 2007).

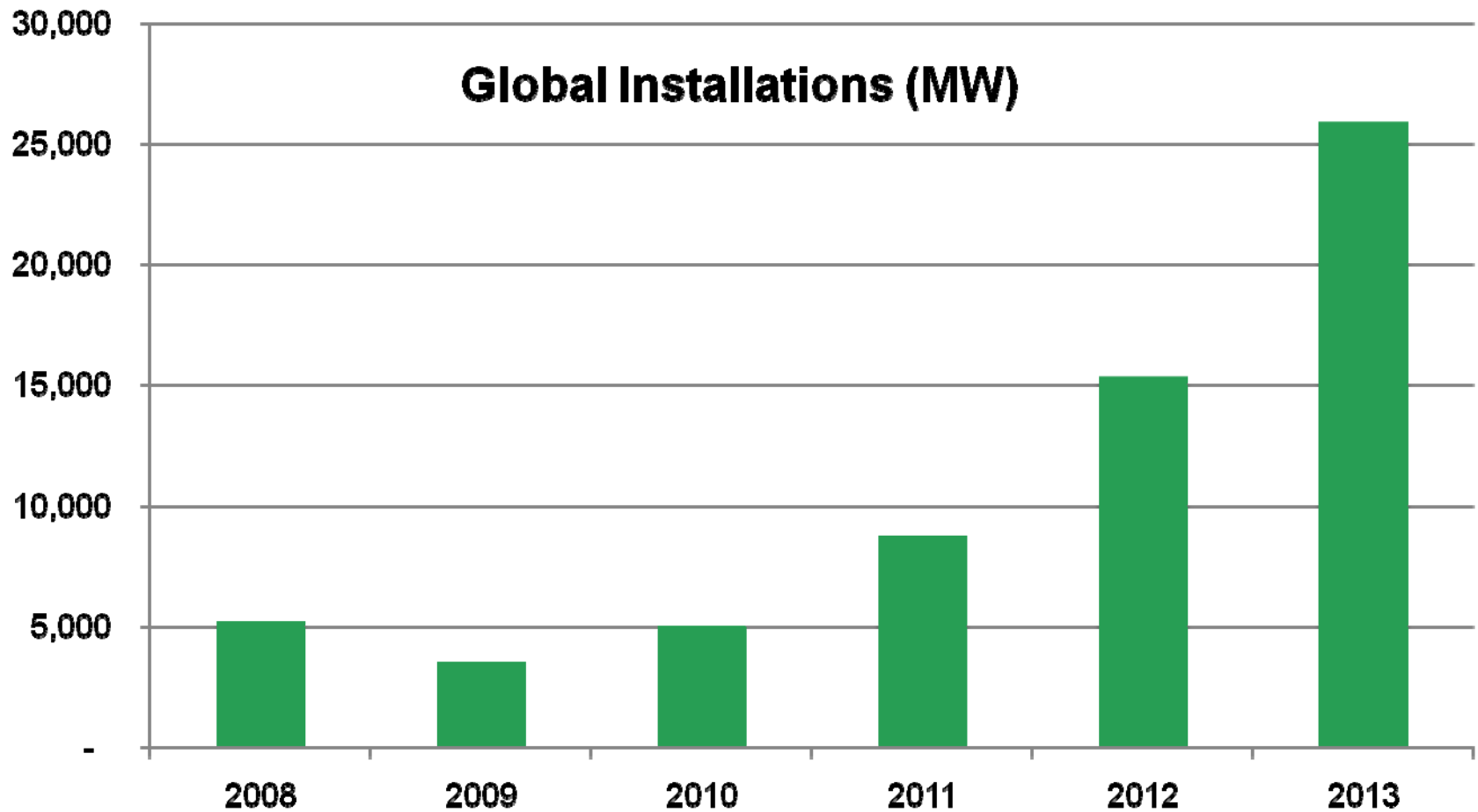
Hawai'i Residents Prefer Solar

Which Source of Clean Energy Is Best for Hawai'i?



Source: Blue Planet Foundation Survey of Hawai'i residents, N=403, Nov-Dec 2008.

Global Demand is Weak in 2009



Source: PV-tech.org, International Photovoltaics, using data from iSuppli Corp.
http://www.pv-tech.org/news/_a/major_market_decline_forecasted_for_the_solar_industry_in_2009_according_to/#



Section 2

NET ENERGY METERING AND FEED-IN TARIFF

FIT vs. NEM

- Section 19, Net Energy Metering (NEM), of the October 2008 Energy Agreement between the State and the HECO Companies:

"NEM currently provides an interim measure to encourage the installation of and pay for renewable energy generated from customer-sited systems, generally PV systems. The parties agree that NEM will be replaced with an appropriate feed-in tariff...."

NEM and FIT

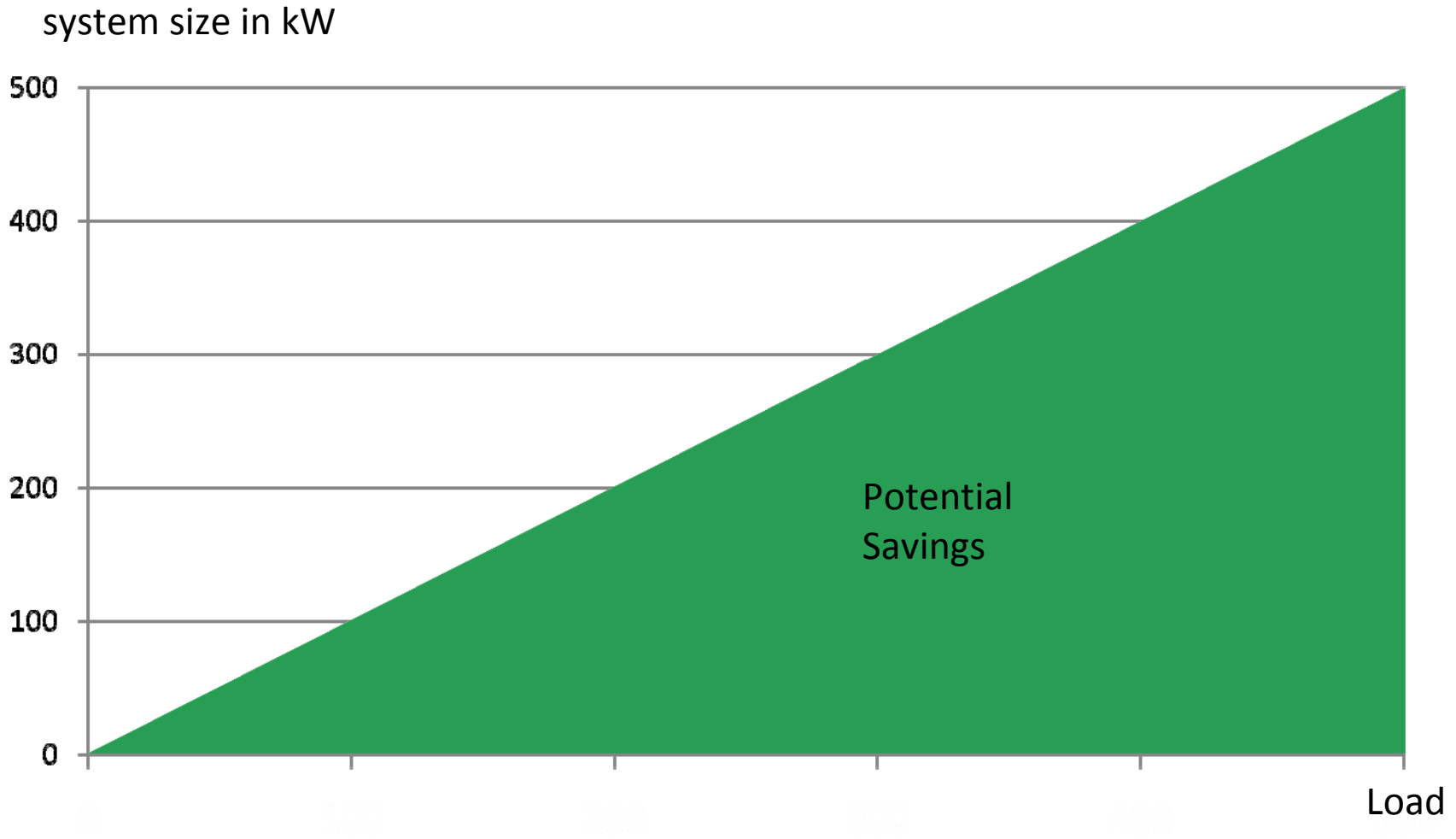
NEM

- ‘Store’ electrons in the grid for later use
- Accounting based on kWh credits, not dollars
- Applies only to systems < 100 kW (in rough terms \$3,000/mo. power bill on Oahu)
- Capped at 1% (HECO) or 4% (MECO & HELCO) of peak demand
- Only credited up to annual kWh used

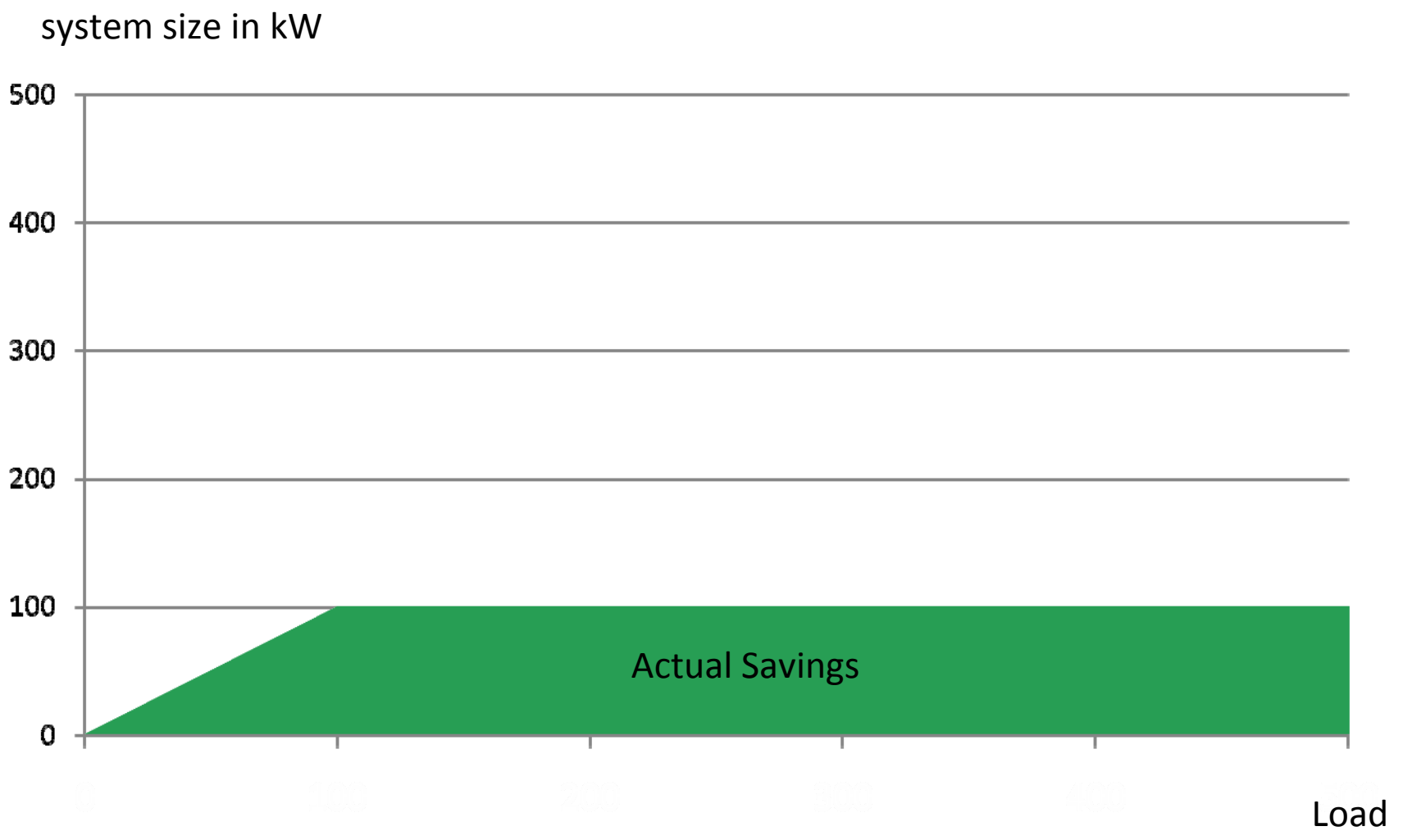
FIT

- Higher system size caps than NEM
- Accounting in dollars not kWh
- Applies to systems up to 5 MW
- Capped at 5% of peak demand (HECO: 60 MW, MECO/HELCO: 10 MW)
- Not linked to load at site

Net Metering Relationship: PV System Size & Load

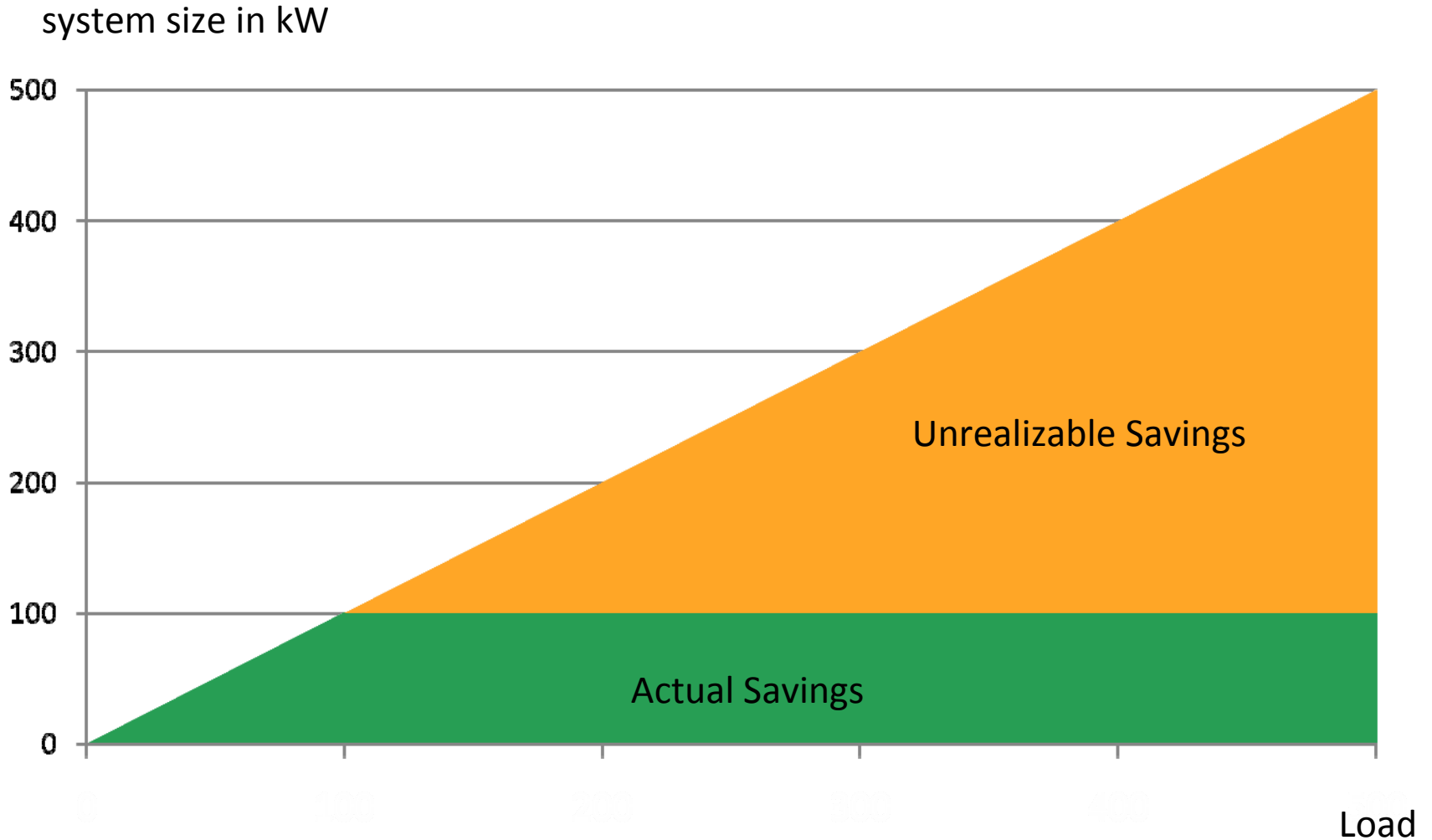


Net Metering: Actual Savings

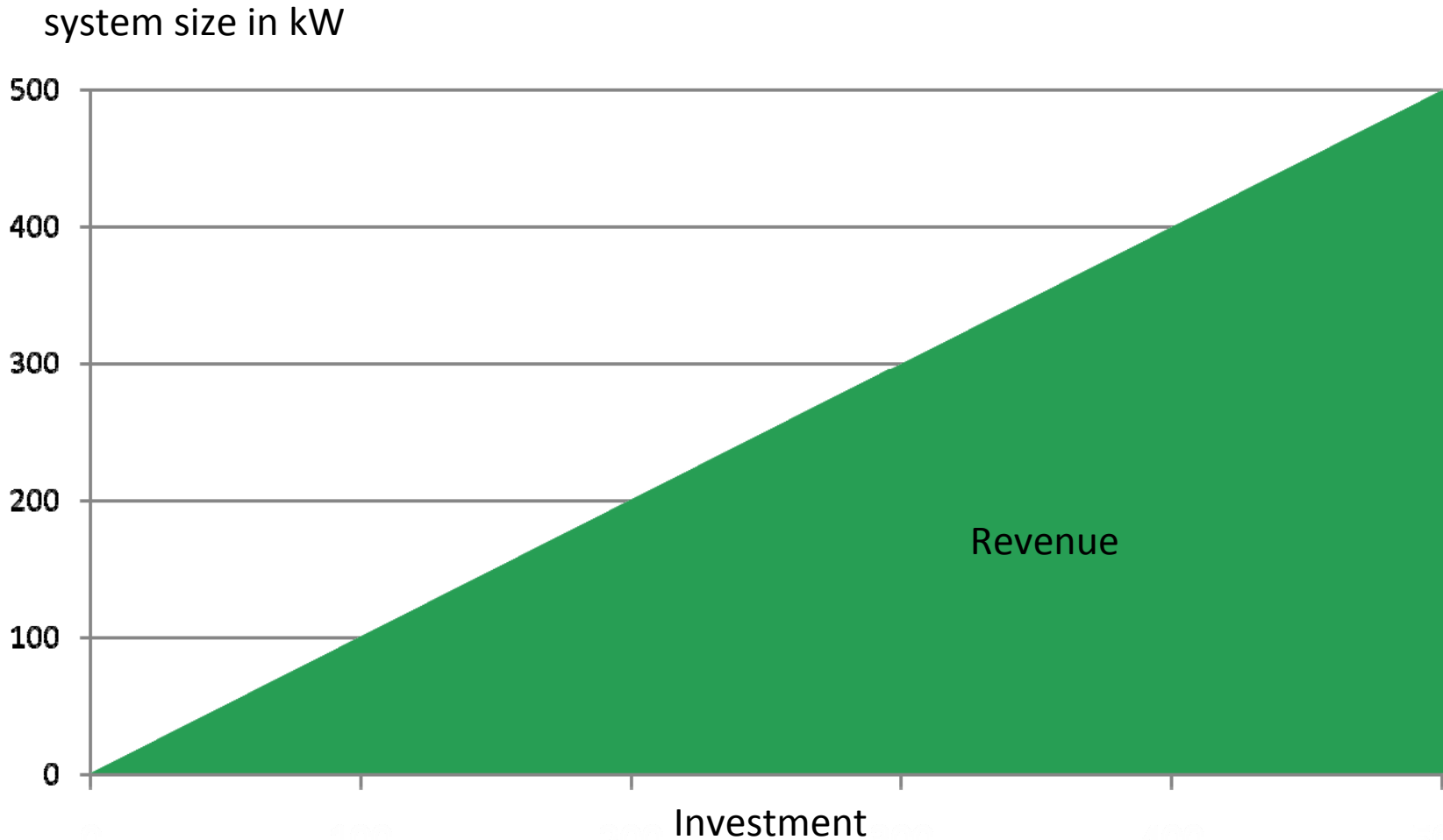




Net Metering: Unrealizable Savings



FIT Relationship: System Size & Investment

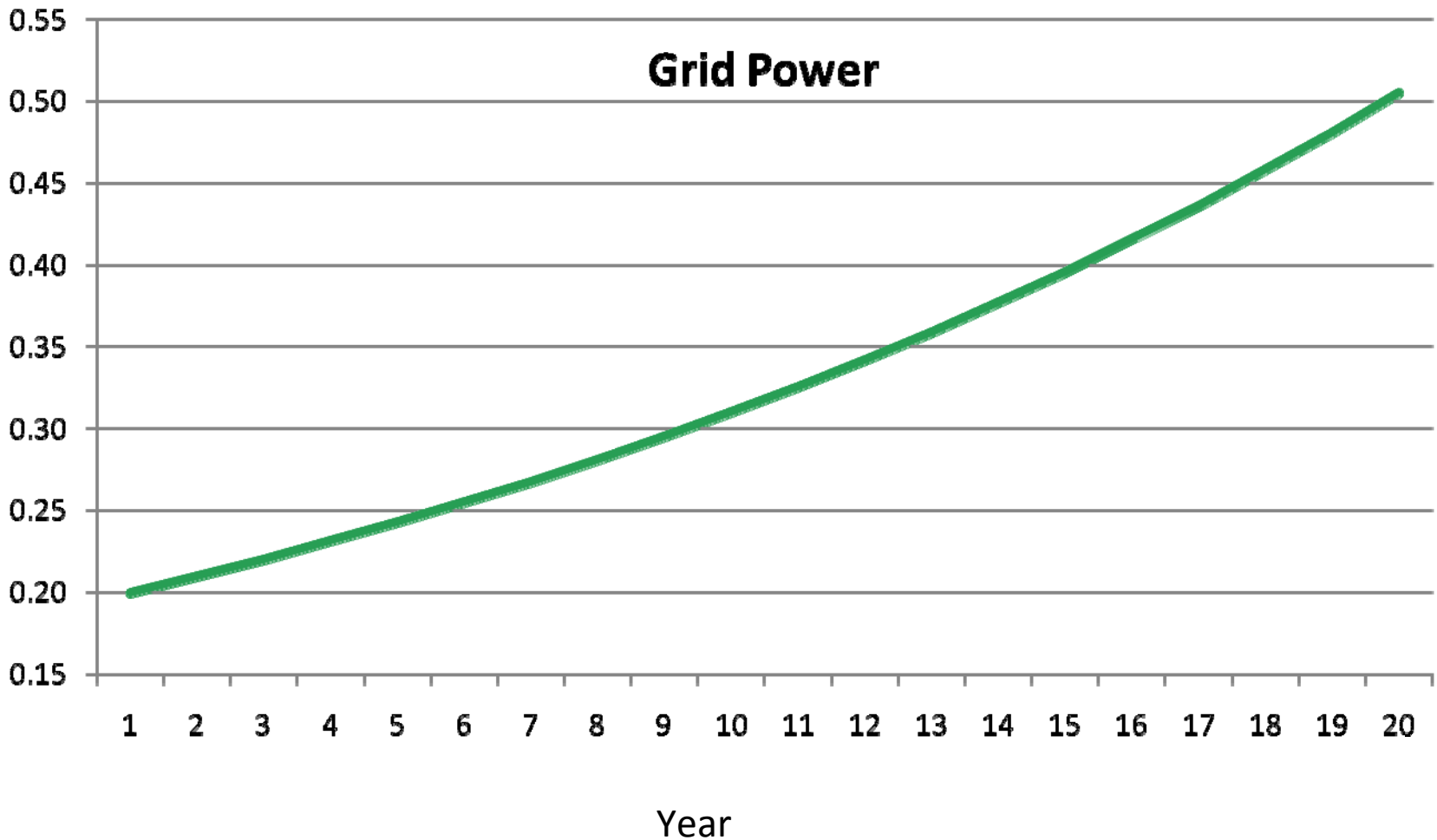




Hypothetical Grid Power Trajectory

\$0.20 at 5% escalation

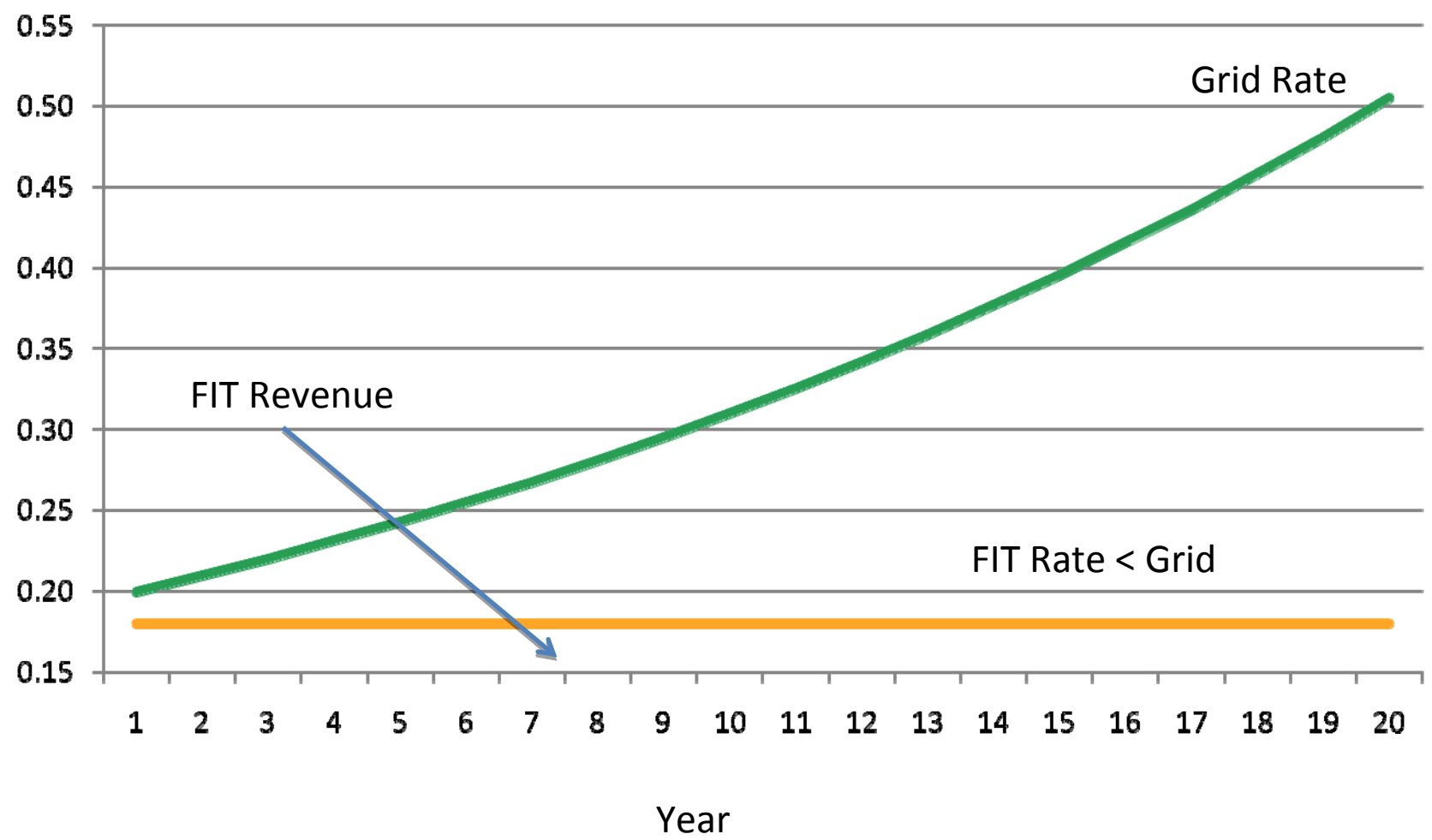
cost per kWh



FIT at \$0.18 per kWh

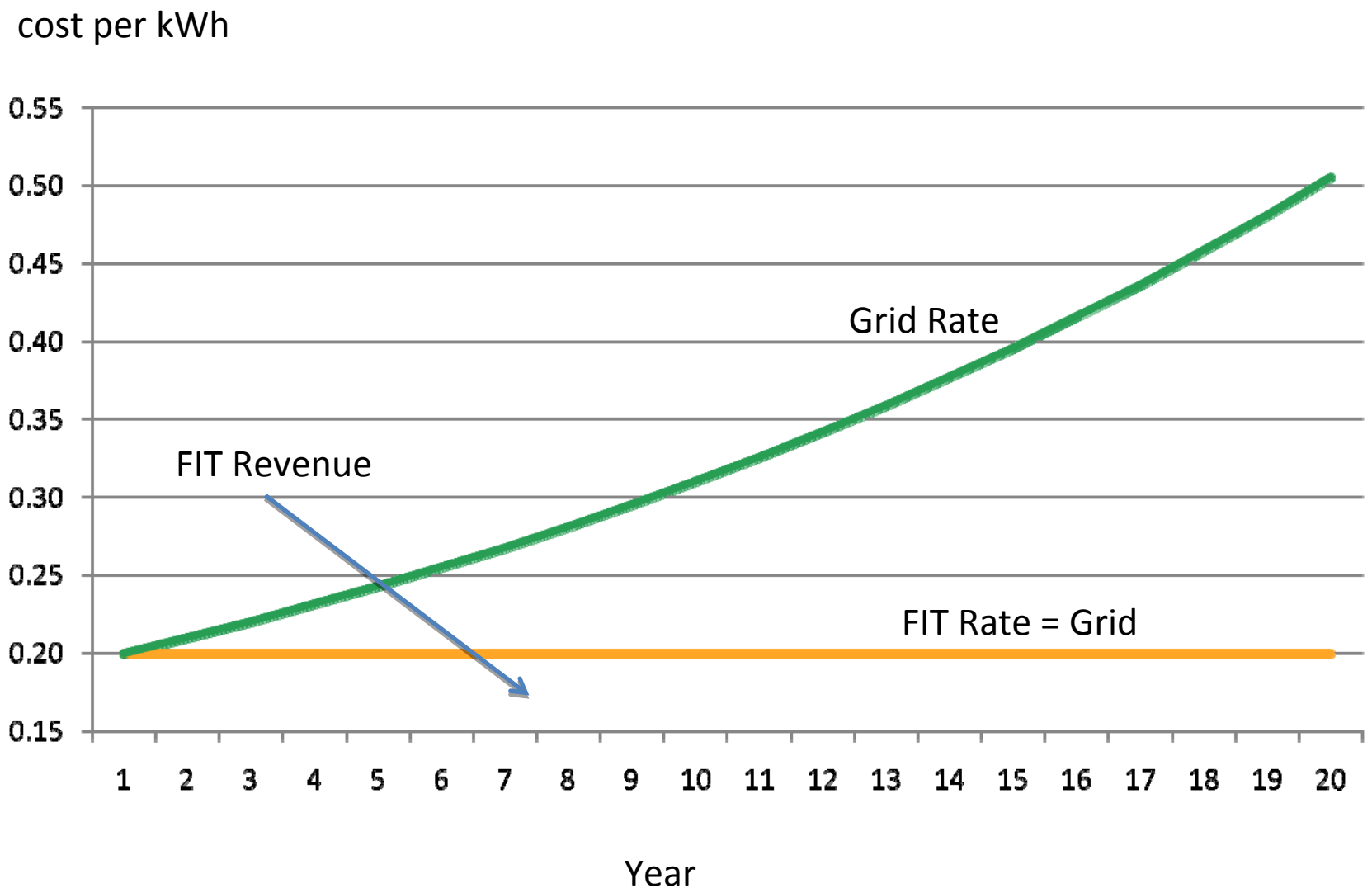
Grid at \$0.20 at 5% escalation

cost per kWh



FIT at \$0.20 per kWh

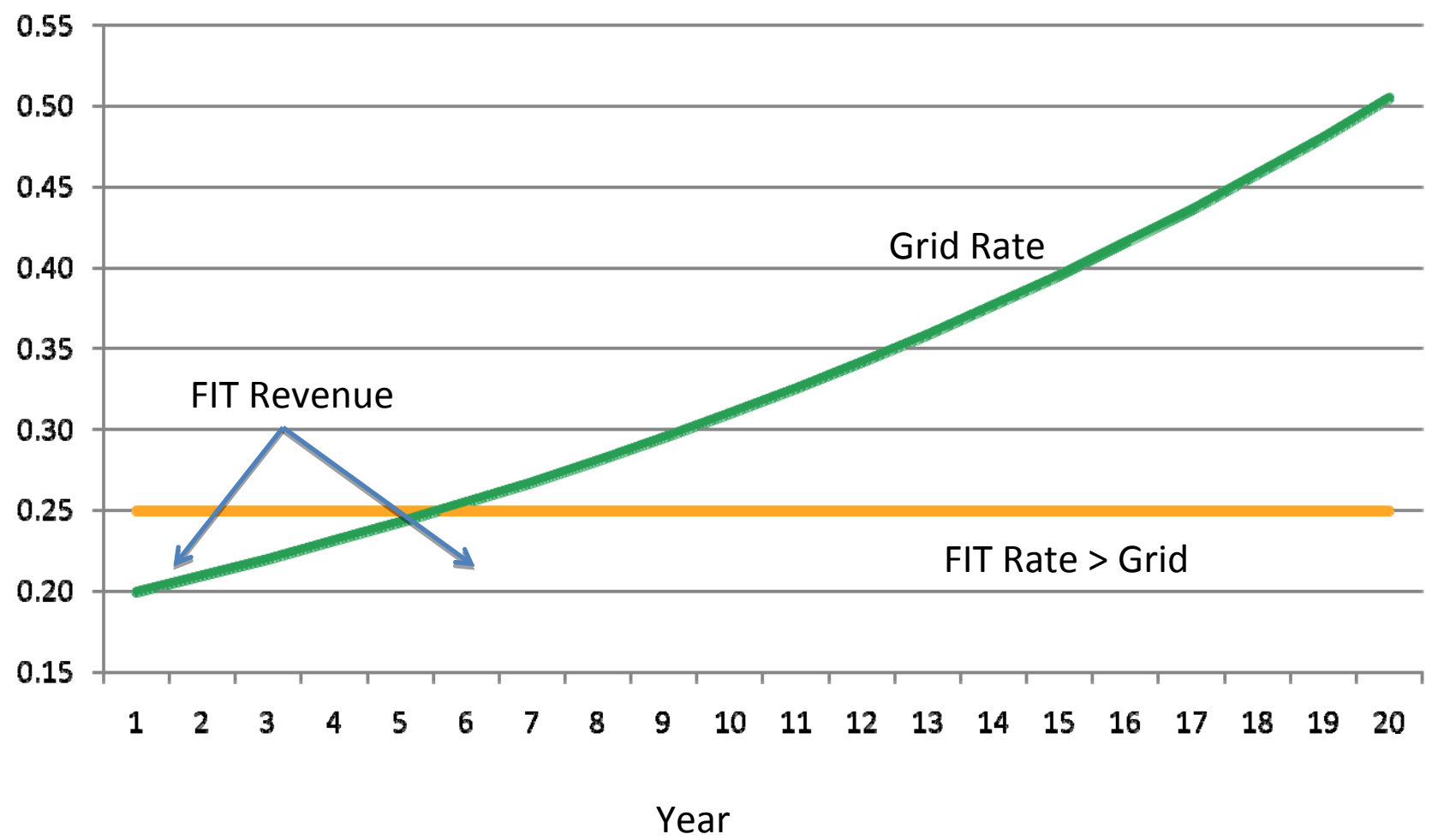
Grid at \$0.20 at 5% escalation



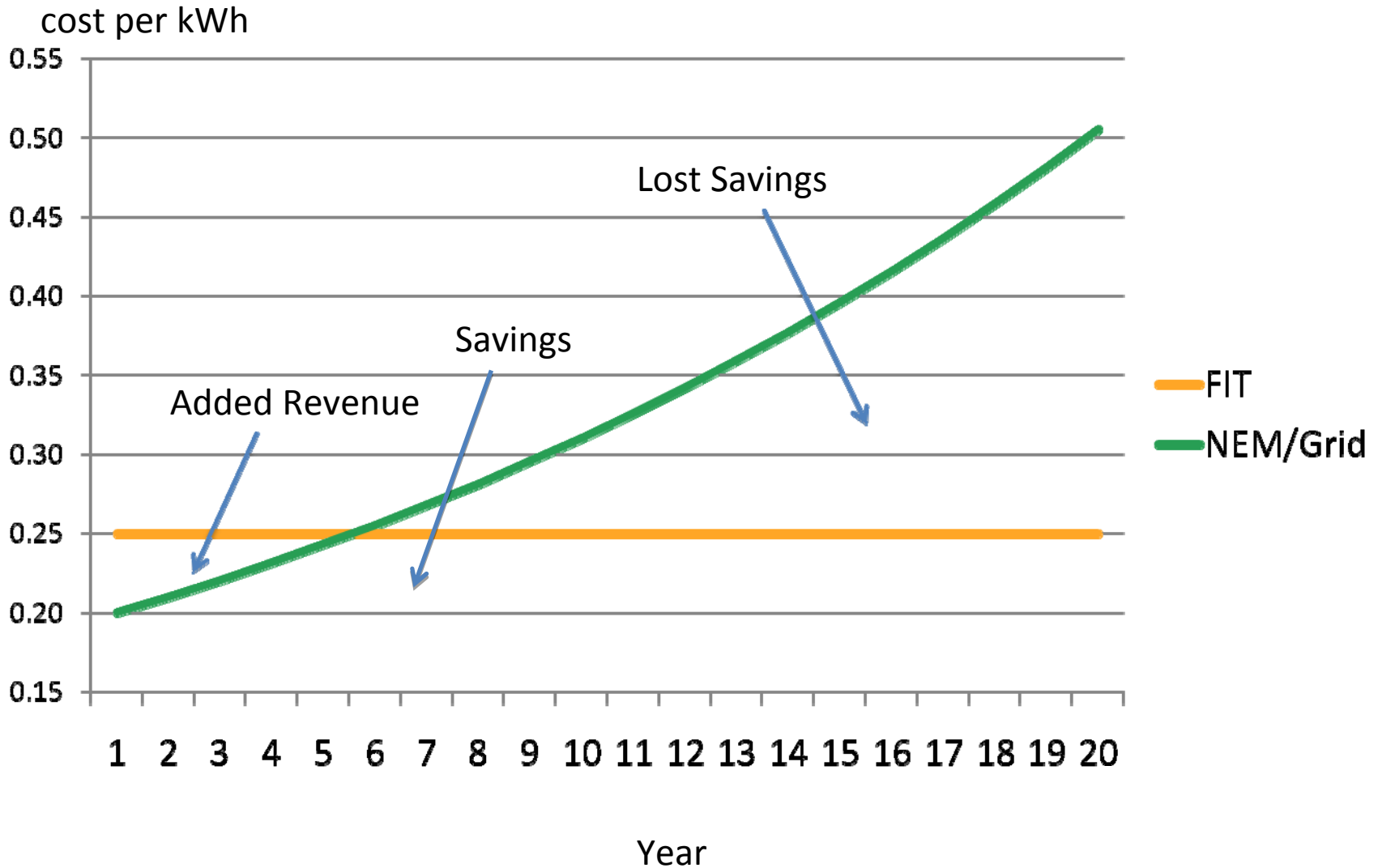
FIT at \$0.25 per kWh

Grid at \$0.20 at 5% escalation

cost per kWh



Above Grid FIT vs. NEM for Customer-Generator with Load



Summary

- NEM & FIT serve different needs in the market
 - NEM is for management of operating costs
 - FIT involves getting into the energy business
 - Risks and rewards are different
- Currently customers needing more than 100 kW can must either:
 - install 100 kW systems
 - size system above 100 kW but never export power
 - negotiate with utility for purchase of excess power
- Rules make it difficult to offset larger loads with PV



Hawaii Solar Energy Association
Strong Hawaii Since 1977

Section 3

INTERCONNECTION

Rule 14H

Additional technical study may be needed based on:

1. Complexity of the portion of the grid system is being interconnected to
2. Connection to a network system
3. Plan to export power
4. Feeder penetration > 10%
5. Starting voltage drop
6. Generating facility capacity
7. Short circuit contribution ratio >5%
8. Type of interface transformer



Challenges of Interconnection Study

- Cost to developer of existing studies has been \$30,000-\$100,000
- Time frame >6 months (typically shifts placed-in-service tax year)
- Outcome can be purchase of equipment to interconnect the system



Interconnecting Neighbor Island PV

- Since the signing of the Energy Agreement there have been developments that indicate that HELCO (and possibly MECO) is in an advanced stage of renewable energy penetration, to the point where the NEM agreement as reflected in Section 19 of the Energy Agreement, needs to be assessed and reviewed to ensure circuit reliability, safety, and grid stability. (emphasis added) - HECO Companies/CA letter to PUC re plan to address NEM, pages 2-3, August 14, 2009 (Docket #: 2006-0084)
- HELCO received the final report from its consultant Electric Power Systems, Inc. ("EPS"), which indicates that under current HELCO system conditions, customer reliability is affected with penetration levels of approximately 2.5 MW or less, for PV having the typical under-frequency inverter trip setting of 59.3 Hz. ... HELCO estimates that the 2.5 MW threshold for resources with the 59.3 Hz trip setting described in the EPS report has already been reached or exceeded on the HELCO system. - HECO Companies/CA letter to PUC re plan to address NEM, pages 4-5, August 14, 2009 (Docket #: 2006-0084)



Section 4

SELECTING A CONTRACTOR

What the Contractor Does

- Works with you to optimize investment in PV
- Explains all stages in the process
- Introduces the customer to tax incentives but explicitly avoids giving tax advice
- Handles design/permitting/utility interactions for interconnection
- Offers options on roof penetrations
- May provide links to financing sources

What to look for

- Not selling just one system/solution
- Past performance in Hawaii
- Knowledge of local process for permitting
- Knowledge of utility procedures for NEM, service upgrades, customer load profile analysis, etc.
- Safety record, safety standards
- Awareness/understanding of roofing and roof warranty issues
- Bonding



Hawaii Solar Energy Association
Strong Hawaii Since 1977

Section 5

FUTURE CHANGES

Future Issues/Trends

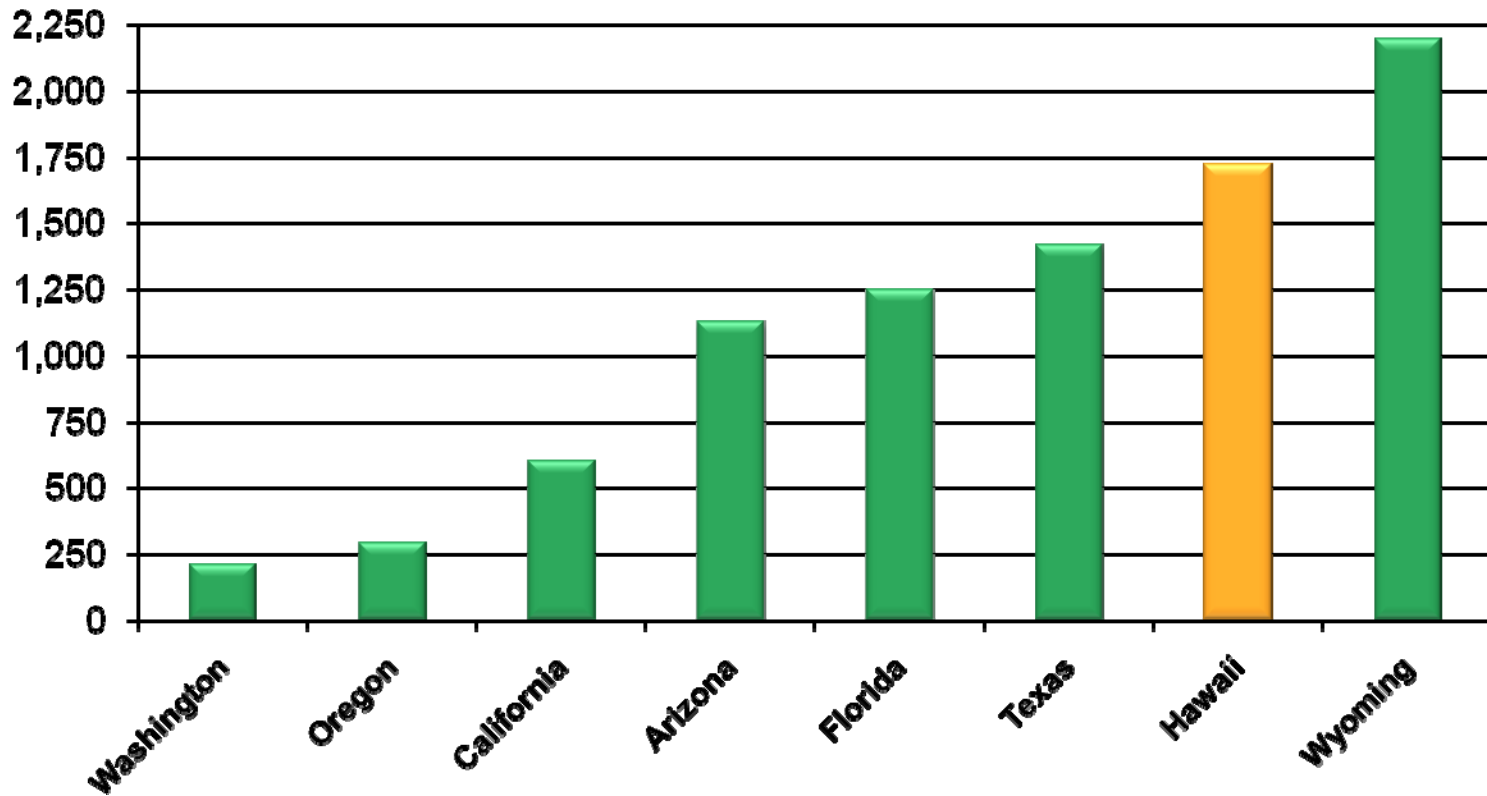
- Rising costs of grid power due to: oil price trends; cost recovery on infrastructure for smart grid; carbon pricing schemes
- End of federal grant option in 2010
- End of bonus depreciation this year
- Continued module availability but with increasing demand
- Declining circuit availability



Carbon Pricing Risk

Carbon dioxide emissions

pounds emitted per MWh



Source: US Dept. of Energy, Energy Information Administration, State Electricity Profiles. Data for 2006.

Thank You

Mark Duda

808.735.1467 (m)

mark@dephawaii.com