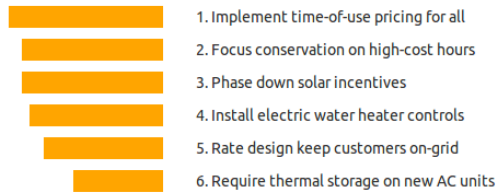


Hawaii Clean Energy Day

Hawaii Clean Energy day - report

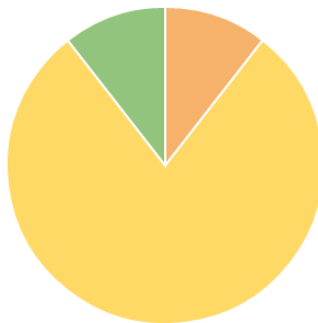
Panel 1

Pick top actions to do in order of importance



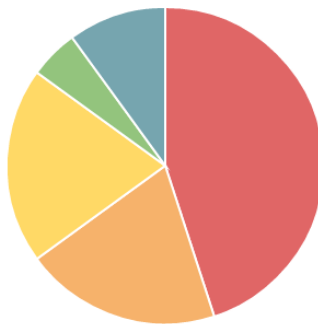
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Which Photo Voltaics (PV) integration stmt is right



duration: 00:01:10

Installing smart grid innovations will in the long run



duration: 01:20:05

All panel questions:

Q & A - ask the panel questions

- Can other panel members also address their opinions re HECO's future?
- Is it realistic to expect HECO to survive the shift to a better world powered by solar energy, or will it be kept alive out of pity?
- Is there any limit to the amount of pv that can be integrated on Hawaii's grids?
- It's been established that Hawaii is fantastic for renewable potential. Is it policy or technology limiting us? How do we solve this?

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- What will it take to change a huge long standing institution? Where do you even start?
- Do you believe clean energy will be affordable for low-income families to adopt to without being pushed further into poverty?
- What kind of public education would be helpful in advancing thermal storage about which most of us have heard little?
- Jim Lazar's ideas for load management are spot on. What revenue model for the utility will best incentive the utility to implement them?
- Jim - any examples of ice chillers operating to provide solar load, and doesn't that increase the needed chiller system capacity?
- Given that HEI is a for profit entity and does not benefit from RE, should HEI ownership be converted to municipal or customer ownership?
- Is the inter-island cable a foregone conclusion if you look at renewable gen capacity on oahu, demand, and policy targets?
- Re: off peak pricing -- Heco doesn't have the capacity to bill residents that way. What is a reasonable timeframe 4 them to implement it?
- Does global warming play a large factor in the Clean Energy Agreement and efforts to go solar?
- Is Big Wind on Lanai dead and where exactly is the planned undersea cable project?
- How should HECO adapt? In what ways? What would you do if you were CEO?
- Should we not tie the RE tax credits to the RPS?
- Do we have the technology to harness, store and use all our renewables ? And why are not doing it?
- What is the status of residential energy storage and why is it much more prevalent on Hawaii Island than on Oahu?
- For Mark: Is RevoluSun being bought out by a firm?
- Do we not need storage to have it's own tax credit incentives?
- Mark, who should pay for storage req'd to accomodate additional PV On the grid? ((everyone/solar owners/other)
- Rick, how do you measure reliability of the grid? On/off? Frequency? Voltage spikes/lags? Are they weighted differently? Can we commoditized
- For Jim: What are the options for HECO? Should the state take over? Should another entity acquire them?
- What incentives are offered by the state to encourage the community to adapt to cleaner energy options?
- As an investor-owned utility, what incentive does HECO management/ shareholders have to increase renewables and reduce customer rates?
- What are some of the challenges to making hydrogen a bigger part of the energy mix in Hawaii?
- Are there any other renewable sources we could tap into, such as offshore wind?
- Time of use pricing would impact NEMESIS contracts. What would that do to distributed generation?
- Since batteries only represent only 0.2% of world storage due to high cost and short cycle life, how can we enable policy for pumped hydro?

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- Any or how much of an impact do government PV installations have on circuit penetration levels where residential customers are on hold?
- What are the challenges to shifting to renewable energy in Hawaii?
- Do we really need two refineries? Why or why not?
- How can we keep time of use rates shift from present models fair for those who have/will invested in the present model?
- Does the state have a plan to systematically achieve affordable renewables ?
- The regulatory process doesnt move @ the pace necessary to implement needed changes, off grid options will continue. What r options 2 manage
- Then Lt. Gov. Brian Schatz took the lead as the true Energy Czar. Who will fill his role? No one seems to be taking the lead.
- How do we accelerate shared value dg projects that combine, for example, grid value and emergency backup value at a critical use facility?
- Off grid PV and storage rooftop would get us to what level? Germany and Japan going this way?
- Why are we only focusing on the transportation side now?
- How can HECO be incentivized to get more low-cost renewable energy projects built?.
- Should HEI not make the findings of their studies public?
- We are talking about executing a renewable plan but meanwhile there is a large LNG plan already moving forward. How did that get ahead?
- This seems like a funeral...where's the energy in the room?
- Has any analysis been done to look at customer savings from moving to time of use rates?
- Everyone talks about listening to the customer . They want cheaper cleaner energy so what can the utility do to get us there?
- As leaders of energy in Hawai'i, what do you want your legacy to be and what are you doing to achieve that goal?
- Is electricity a commodity or a service? If a service, who provides the service?
- Rick tells us we need a vision but isn't HCEI supposed to have established that
- What opportunities are available for community involvement in renewable energy projects?
- Why doesn't HNEI fund coordination of Time of Use studies and Report to Consumer Advocate?

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Panel 2

Panel 2

Getting the Utilities' Act Together

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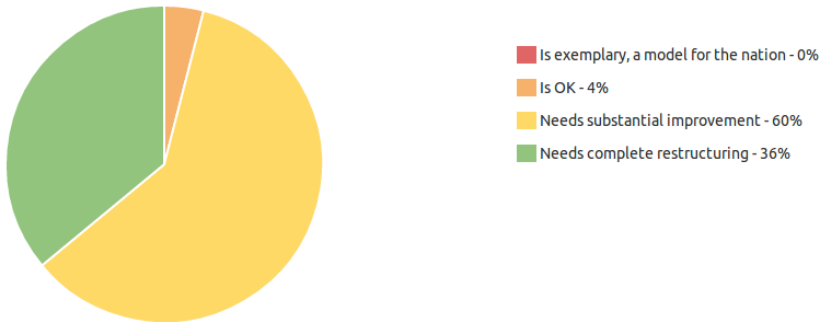
Q & A - ask the panel questions

- As an investor-owned utility, what incentive does HECO management/shareholders have to increase renewables and reduce customer rates?.
- How do you see the role of the PUC in future of energy regulation in Hawaii?
- How long do you imagine LNG serving as a bridge fuel? Is there a timeframe? What, if any, is the phase out strategy?
- How will grid modernization costs be mitigated so not to hit rate payers?

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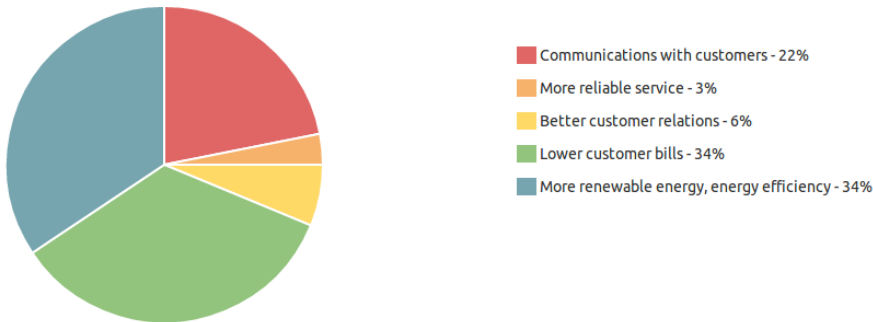
How HI energy utilities are owned, managed and regulated

duration: 00:00:56



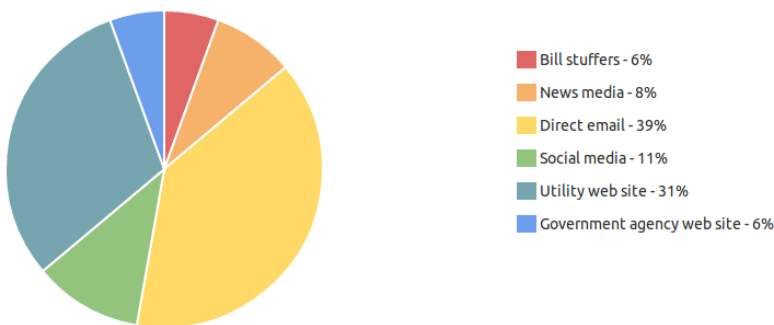
Choose what needs the most improvement for energy utilities?

duration: 00:00:50



Select the best way for the utility to communicate with you

duration: 00:01:38



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All questions: **Q & A - ask the panel questions**

- Why haven't we implemented real time pricing yet? Seems like a low cost first step to deal with duck curve & load matching challenges
- Michael Yamane, in what ways are the challenges that kauai face unique? What can Kauai offer the other islands, and vice-versa?
- When do you think customers will see the first rate decrease in recent history?
- Could publishing more real time data about usage increase public knowledge and involvement?
- How are non-pv owners served by rates that pay back pv owners more than what it would cost the utility to provide the same resource?
- Should there be two Public Utilities Commissions with one dedicated to electric utility issues and the other handling other utilities?
- As an investor-owned utility, what incentive does HECO management/shareholders have to increase renewables and reduce customer rates?.
- How do you see the role of the PUC in future of energy regulation in Hawaii?
- How can HECO be incentivized to get more low-cost renewable energy projects built?.
- Is there any chance of reopening the wheeling docket to accommodate IPP community energy projects.
- How can we ensure that utilities are engaging in effective price/non-price conservation efforts?
- Will HEI release all studies and deliverables to the public?
- To HECO - what analysis method is being used to analyze trade-off and established its preferred plans forward?
- Can HECO change with the times and accelerated technology development?
- What type of decoupling policy (limited, partial, full) is most appropriate for promoting both conservation & social equity?
- Should utility be municipal or customer owned?
- What major change has HECO instituted to meet customer need and desire for low cost clean electricity?
- How do we better capture shared value for grid assets and get out of the 'single project single owner single purpose' silo?
- Will the PUC re-examine decoupling and NEM policy? Decoupling along with NEM leads to higher prices to those stuck on the grid
- What is the utility's target rate of the future?
- Will LNG bridge have a definitive and declared end?
- Joe: What are the specific business model alternatives being considered? What will be residential power cost under each in 2020?
- KIUC- Do PV driven time of use rates require a full rate reset where those with more daytime load see a net reduction in cost?
- How long do you imagine LNG serving as a bridge fuel? Is there a timeframe? What, if any, is the phase out strategy?
- Is it truly aloha to depend on LNG which is extracted in way that pollutes water resources & produces methane, a more potent GHG than CO2?

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- Do we have the infrastructure to effectively offset petroleum based energy with LNG? Can LNG be widely used easily?
- What plans/steps, if any, are the utilities taking to educate their customers/stakeholders on the role they play in Hawaii's energy future?
- How will grid modernization costs be mitigated so not to hit rate payers?
- Re HECO. Do you have staff dedicated to combing through your customers' energy use and looking for interruptible load opportunities?
- Is HECO looking at its costly overhead structure as part of its cost reduction plans?
- How do you account for methane, a more potent GHG than CO2 when framing LNG as clean?
- Why do LNG when we have all these great renewable resources. Isn't LNG just kicking the can down the road and losing pros time.
- Would HECO buy LNG from Hawaii Gas in a regulated model allowing each utility do what it does best? What about IPPs?
- Would identifying desirable uses of AMI data before selecting and procuring AMI infrastructure result in a more optimal solution?
- Mike - What is net impact on residential retail rates of AMI investment for KIUC in 2020?
- KIUC's NEM program is fully subscribed. When will KIUC expand the prgm to allow addl subscribers & what needs to be done to allow expansion
- KIUC plans to reduce customer bills by at least 10% over the next 10 years. How much does HECO plan to reduce their customers bills?.
- Does the business model of a cooperative make it more flexible in adopting more renewable energy vs. a publicly traded company like HECO?
- Why not one integrated utility system for the whole state. Wouldn't that be more efficient and less kuleana?
- Is a cooperative Model workable for neighbor island eg HELCO?
- To Mike, What incentive would you offer customers to prepay, instead of paying after the fact?
- Where was HECOs sense of urgency before the PUCs docket? HECO has historically been reactionary rather than proactive. What changed?
- Have the utilities analyzed whether customers are willing to pay for varying levels of reliability and, if so, what were the results?
- PUC: if the white paper is a map, what is the destination? Especially In this age of climate change and high cost fossil fuels...
- To PUC Chair - what specific criteria/benchmarks will be used to evaluate pending utility plans from a cohesive perspective?
- What is endgame for utility and the blueprint to get there?
- Should smart grid efforts prioritize system or end user improvements? Wouldn't system upgrades expand options more than end user efforts?
- If policies to change complex systems and businesses is ther a need to provide for a procee beyond contested case process?
- Does the PUC have the appropriate amount of autonomy from the Governor's office?
- Should HECO companies' business model be transitioned to a cooperative?
- Is there enough information to conclude that a long-term bet on importing yet another fossil fuel is "smart public policy"?

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- HECO: if LNG is part of HECO's plan, will the company/shareholders accept the risk of sunken infrastructure costs and rising fuel costs?
- How is it possible to lower prices in the short term and upgrade the grid to accept more DG, which will require large capital investments?
- what about costs of LNG that aren't measured in dollars? environmental...water pollution during extraction, methane as a more potent GHG.
- Grid modernization is essential, however what are the challenges in achieving this?
- Can HECO become solely a T&D company?

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Panel 3

Panel 3

Transportation

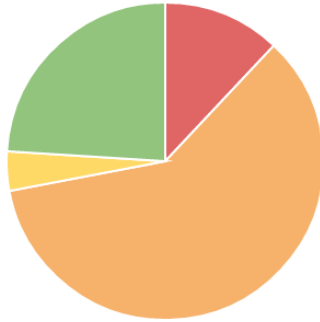
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Q & A - ask the panel questions

- Sorry but you'll never get me out of my car. I'll fight you if you do. So what are you going to do to change my mind?
- EV or CNGV? Which appear to be an optimal solution for Hawaii
- What ideas do you have for us to motivate our employers to adopt alternative transportation policies?
- With 2000 EVs on the road (Oahu), is there really any impact yet on highway funding? Especially given their light weight vs trucks etc.?
- Do we need a Public Benefits Fee Administrator (like Haw. Energy in electric sector) for transportation?
- How do we reduce transportation energy consumption and vehicle trips while relying on tourism as the primary economic industry?
- Has an analysis been conducted to verify economic maximum and technological maximum of possible reduction of fossil fuels for transportation
- What long term plans does the State DOT have to integrate with Kauai's community vision as expressed in their multimodal land trans plan?
- Where do technologies like uber/lyft/etc. fit into the transportation planning effort?

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New measures to improve transportation should focus on



duration: 00:00:44

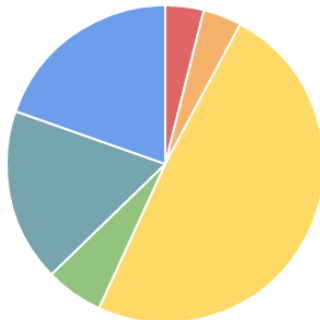
- Increasing and improving roads - 12%
- Reducing vehicle miles traveled - 60%
- Increasing vehicle efficiency - 4%
- Provide electric vehicle infrastructure - 24%

Prioritize the next steps to improve transportation



duration: 00:00:59

Hawai'i should fund innovative transportation initiative via



duration: 00:05:54

- The State general fund - 4%
- County budgets - 4%
- Taxes on fuels - 49%
- Excise tax funding to the counties - 6%
- Motor vehicle registration fees - 18%
- Increasing federal funds - 20%

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All the questions: **Q & A - ask the panel questions**

- What policy is needed to reduce VMT & still have funding for clean transport programs and infrastructure? How do fuel taxes fit into this?
- Will bikes be allowed on the Rail? What about suitcases (for airport trip) which at present are not allowed on busses?
- Our highways are poorly designed and don't meet federal safety standards. How can we fix this as part of the transportation discussion?
- How should P2P companies like Lyft be regulated?
- Will the bike lane on King St be protected (E.g. raised barrier) - safe for children to use ?
- How is getting rail even a discussion in a city where people spend several hours in cars everyday?
- Sorry but you'll never get me out of my car. I'll fight you if you do. So what are you going to do to change my mind?
- Liz, are benefits of CNG (specifically cost) applicable to Hawaii?
- In Science (2014), emissions experts reported that NG emissions for transp. are worse than diesel. Why would we want that in Hawaii?
- Re NG for vehicles: if we are going to revamp our transportation fuel infrastructure, shouldn't it be for a fuel we can produce locally?
- Are you looking at European cities for managing traffic and biking in cities? Amsterdam would be a comparable sized city.
- How could we encourage employers to allow teleworking without offering tax credits?
- EV or CNGV? Which appear to be an optimal solution for Hawaii
- What ideas do you have for us to motivate our employers to adopt alternative transportation policies?
- Let's start changing the culture in attitudes to traffic together...
- How fast can we get google cars / driverless cars on the roads?
- With 2000 EVs on the road (Oahu), is there really any impact yet on highway funding? Especially given their light weight vs trucks etc.?
- Other states have vehicle emission testing. Has HDOT considered similar type of testing to encourage alt. fuel vehicles & increase revenues
- Could we subsidize ev bikes for people?
- Do we need a Public Benefits Fee Administrator (like Haw. Energy in electric sector) for transportation?
- How do we reduce transportation energy consumption and vehicle trips while relying on tourism as the primary economic industry?
- Has an analysis been conducted to verify economic maximum and technological maximum of possible reduction of fossil fuels for transportation
- Compressed natural gas, hydrogen, EVs, other - is there a lean towards one technology over the others in planning?
- What long term plans does the State DOT have to integrate with Kauai's community vision as expressed in their multimodal land trans plan?
- What about employer sponsored car share options?
- Are there many employers here who have commuter benefit programs? What would motivate employers to do this?

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- With 1/3 of our transportation fuel being used in aviation - is there any plan to tackle that?
- Where do technologies like uber/lyft/etc. fit into the transportation planning effort?
- How is the lack of charging stations on Kauai and Big Island being addressed?

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Panel 4

Panel 4

Implementing Clean Energy: What Must Happen?

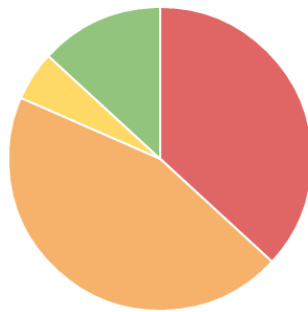
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Q & A - ask the panel

- How can we charge policy makers to make daring new policies to have real lasting impact.
- To Jeff, Why do you want to promote storage arbitrage?
- Is there any evidence that smart meters sustain energy conservation in the long run, justifying the costs of installing meters?
- Hawaii can't import LNG forever. How will HawaiiGas make money if it is not importing LNG (ie. at the end of the "bridge").
- Isn't choosing LNG today a lot like choosing fuel oil 50 years ago?
- What % of our energy demand could be supported by renewable gas (not LNG)?
- If we import LNG, will that also probably mean building new fossil fuel-based generation? How long will we be stuck with that?
- Can we achieve our renewable goals while guaranteeing socioeconomic equality in the benefits or are these two mutually exclusive?
- Who should convene the "key stakeholder group" of decision makers? Isn't the glaring leadership gap one of our challenges?

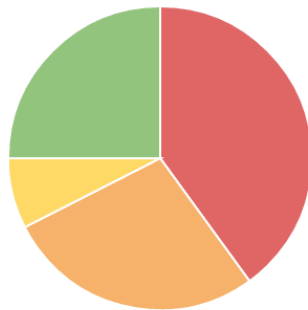
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Focus new clean energy initiatives primarily on



duration: 00:01:00

Biggest long-term impact to reduce HI carbon footprint is



duration: 00:01:23

All the questions: Q & A - ask the panel

- If spending \$ on LNG infrastructure is an option, will HawaiiGas accept the risk of stranded assets and rising fuel costs? Or ratepayers?
- Why emphasize CNG if the gorilla in the room is our ability to afford projected road capacity - something not changed by fuel switching?

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- Scientists report that lifecycle emissions for NG as a transp. fuel are no better than diesel. How can Haw Gas deal with upstream emiss.?
- Presently, fuel costs are 30% of Kauai's operating budget. What is the state doing to develop a renewable liquid fuel substitute?
- How can we charge policy makers to make daring new policies to have real lasting impact.
- Alex - fun product... Mike - good question sorting
- Are broadband infrastructure part of the overall plans to let people work from home?
- Will letting workers work from home really lower the overall energy consumption?
- To Jeff, Why do you want to promote storage arbitrage?
- Is there any evidence that smart meters sustain energy conservation in the long run, justifying the costs of installing meters?
- What role will renewable natural gas play in Hawaii's energy future?
- Is LNG really "clean energy." Methane (primary component of LNG) is 20+ times stronger as a greenhouse gas compared to CO2.
- With all the LNG talk, how does hawaii align it's environmental ideals with fracking?
- Alicia, Is it truly aloha to depend on LNG since it is extracted in way that pollutes water resources & produces methane, a more potent GHG
- How, exactly, does importing LNG make our energy system more reliable?
- Are the LNG data publicly available? API?
- Alicia, How do you account for methane, a more potent GHG than CO2 when framing LNG as clean?
- How, exactly, does importing LNG make our energy system more secure?
- Does Hawaii Gas have model of local RNG supply and how does it compare to your natural gas demand model?
- Should we turn to LNG W/ its major implications on water resources and high methane emissions during extraction processes?
- Hawaii can't import LNG forever. How will HawaiiGas make money if it is not importing LNG (ie. at the end of the "bridge").
- Isn't choosing LNG today a lot like choosing fuel oil 50 years ago?
- What % of our energy demand could be supported by renewable gas (not LNG)?
- LNG seems to be moving ahead because at least one company is taking ownership of moving it forward. Who is taking ownership of renewables?
- As Mr. Datta asked last year at APCES, who carries the infrastructure cost risk for LNG? The consumer/the importer/the utility?
- What is the PUC's role as it relates to Hawaii Gas's pair of LNG?
- If the community decides that the risk of importing yet another fossil fuel is not acceptable, will HawaiiGas accept that decision?
- Alicia, if LNG is to be imported, how does Hawaii Gas envision a sustainable energy resource with LNG for Hawaii?
- If we import LNG, will that also probably mean building new fossil fuel-based generation? How long will we be stuck with that?
- Historically, LNG prices are more volatile than crude oil. How can Hawaii protect itself from that price volatility?

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- Can we achieve our renewable goals while guaranteeing socioeconomic equality in the benefits or are these two mutually exclusive?
- What has been done in transforming the system to date?
- Given our limited forecasting ability, can we determine now what will be the optimal energy system in the future?
- Given the shift in scope, how do we get the right people in the room for the transportation work we're proposing?
- Wouldn't it be cheaper if HECO and Hawaii Gas collaborated in importing LNG?
- Does low cost LNG depend on fracking?
- If H Gas is viewing LNG as an enabler with a definitive timeline, what is H Gas' s business plan post that and can it be done today?
- Can we produce our own renewable fuels to be totally independent of imported fossil fuel?
- To Alicia, what is the solution to fracking of natural gas?
- Have you factored the environmental costs of LNG into the supposed cost savings?
- Why don't we have dynamic pricing already? It seems like a massive no-brainer
- Who should convene the "key stakeholder group" of decision makers? Isn't the glaring leadership gap one of our challenges?
- How cheap do renewables have to be to offset the massive capital expenditures required to accommodate them? AMI, storage, grid mod, flex gen
- Is it aloha to depend on LNG as it is extracted in way that pollutes water resources & produces methane, a more potent greenhouse GHG than c