Proposal to the State of Hawai‘i: LNG Infrastructure and Natural Gas-Fired Power Plant Development on O‘ahu

JERA
AMERICAS

March 17, 2026

Introduction

To the State of Hawaiʻi

Hawaiʻi is defined by its natural beauty, its deep connection to the land and ocean, and its long-standing cultural and economic ties to Japan. As fellow island communities, Hawaiʻi and Japan share the realities of geographic isolation, dependence on imported fuels, exposure to global energy shocks, and a responsibility to protect our environment for future generations.

Hawaiʻi's energy challenge: affordability and sustainability

As highlighted in the Hawaiʻi State Energy Office's Alternative Fuel, Repowering and Energy Transition Study, Hawaiʻi faces an urgent and unique energy challenge. Oʻahu residents pay some of the highest electricity rates in the United States because the State's power system still relies heavily on oil. Hawaiʻi remains the only U.S. state that burns oil at this scale for electricity generation.

The State's dependence on oil creates economic and environmental burdens. It places pressure on families, businesses, and public services while exposing the State to volatile global fuel prices.

O'ahu in particular faces a significant sustainability challenge. About 70% of Oʻahu's electricity is generated from oil, giving the State one of the highest carbon emission intensities in the nation—roughly double the national average. As a result, each kilowatt-hour consumed carries a disproportionately high environmental impact.

Bridging to a 100% renewable future

At the same time, Hawaiʻi has set one of the world's most ambitious energy goals: 100% renewable electricity by 2045.

While deeply respectful of this commitment, experience from island systems around the world—including Japan—shows that renewables alone cannot yet meet demand at all hours without firm, flexible generation to maintain reliability and affordability. Without such a bridge, even the most ambitious energy transition plans risk becoming slower and more costly.

Our proposed partnership for Oʻahu

It is in this context that JERA respectfully proposes a partnership. Building on the Strategic Partnering Agreement between the State of Hawaiʻi and JERA, we propose a transformative energy project for Oʻahu: a ~500 MW hybrid combined-cycle and simple-cycle gas turbine facility powered by liquefied natural gas.

By replacing aging oil-fired generation, this facility could reduce electricity generation costs by approximately 20% compared to current oil-based power, providing meaningful relief to residents and businesses.

The project would also reduce greenhouse gas emissions by roughly 20% over the next two decades by displacing oil generation while enabling greater integration of solar and other renewables. Modern combined-cycle technology provides the flexibility needed to support renewable energy on the grid.

Importantly, this technology would not lock Hawaiʻi into a fossil fuel future. The facility could transition over time to alternative fuels such as hydrogen and renewable natural gas.

Commitment to Hawaiʻi's long-term future

This project represents an investment in affordability and Hawaiʻi's long-term energy resilience. It would strengthen grid reliability while supporting continued renewable growth.

JERA brings decades of experience delivering world-class liquefied natural gas and combined-cycle power projects, including in island and import-dependent systems such as Japan. We are committed to working closely with the State of Hawaiʻi, its regulators, utilities, and communities to advance this project responsibly and transparently.

This proposal offers a practical pathway forward—one that reduces costs today while strengthening the foundation for a fully renewable future.

Thank you for your consideration.

John O'Brien

CEO, JERA Americas

State of Hawai‘i – JERA Strategic Partnering Agreement

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- The State of Hawai‘i, JERA Co. Inc., and JERA Americas executed a Strategic Partnering Agreement (“SPA”) on October 6, 2025, which established a framework for collaboration to support the State’s decarbonization goals and advance clean energy initiatives
- The SPA reiterated that Hawai’i State Energy Office’s study estimates ~US$2 billion is required to upgrade the State’s thermal infrastructure, and indicated that JERA is exploring potential equity and additional investments necessary to fulfill the study’s objectives and the State’s renewable and decarbonization policies
- **This proposal addresses part of the key initiatives outlined in the SPA, focusing on O‘ahu**. The other initiatives will be addressed in the future in subsequent phases

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Key Initiatives outlined in the SPA

THIS PROPOSAL’S FOCUS

- **THERMAL GENERATION**: Develop and invest in new and repowered thermal generation
- **LNG INFRASTRUCTURE**: Develop offshore LNG facilities and onshore infrastructure for natural gas distribution
- **COMPETITIVE FINANCING**: Mitigate financing costs and use the most advantageous capital sources
- **RENEWABLES DEVELOPMENT**: Support continued renewable development to balance sustainability with reliability
- **GRID PLANNING**: Upgrade grid modeling to optimize the generation mix and validate recommendations
- **REGULATORY REFORMS**: Streamline power procurement, tariffs, interconnection and electrical dispatch
- **COMMUNITY BENEFITS**: Establish an Energy Center of Excellence for the Pacific, and support workforce training and academic collaboration for community benefits

JERA is a leader in global gas-to-power and renewables, and is ready to advance an ongoing partnership with Hawai'i

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Global natural gas turbine project delivery

34 GW

thermal projects delivered since 2000

- Constructed 34 GW of gas turbine projects across 8 countries over the last 25 years
- Strong turbine supplier relationships open pathway for 2030 delivery
- Strong track record of financing at a competitive cost of debt, and in an open book and transparent way

Extensive global liquefied natural gas portfolio for competitive supply

#1

largest LNG procurer for self-consumption globally

- Procures ~35 mtpa liquefied natural gas annually from diverse suppliers around the world
- Operates 22 LNG carrier vessels
- Extensive LNG storage and regasification experience with 11 terminals across Asia

Experienced power plant operator

#1

largest fleet of natural gas-fired power plants

- Has the #1 largest portfolio globally with 55+ GW of natural gas-fired power plants
- Operates 50+ thermal generation projects across 10+ countries
- Brings extensive experience with island power systems

Leader in lower-carbon fuels and renewable energy

6 GW

and growing through new investment

- Diverse portfolio of Solar, Wind and Storage
- Operates 20% NH_3 co-firing at Hekinan (Japan) and 40% H_2 co-firing at Linden (US), aiming for 100% NH_3/H_2 capability by 2050
- $1.4 Billion investment into blue ammonia production in USA
- JERA is looking to scale renewable energy in Hawai'i

Support Hawai'i's Decarbonization Goals

Net Zero

JERA corporate commitment by 2050

- Lower-carbon natural gas to support system reliability during the energy transition
- Modern turbines technology to support greater renewable integration and grid flexibility
- Advance clean hydrogen and ammonia-based fuels to build toward net zero goal

JERA has the world's largest fleet of natural gas-fired generation with significant liquefied natural gas usage

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Natural gas-fired generation capacity, GW

Company	HQ	Natural gas-fired generation capacity, GW	Significant liquefied natural gas use
JERA	Japan	55	✓
الشركة السعودية للكهرباء Saudi Electricity Company	Saudi Arabia	30	*Limited*
محطة كهرباء العاصمة الادارية	Egypt	30	✓ [1]
Gazprom	Russia	28	*Limited*
Vistra Energy	USA	28	*Limited*
Calpine	USA	26	*Limited*
NextEra Energy	USA	26	*Limited*
Engie	France	25	✓
Southern Company	USA	23	*Limited*
Duke Energy	USA	23	*Limited*

Key insights

- JERA has the largest fleet of natural gas-fired generation, and holds the #1 position for overall operational and committed natural gas-fired generation capacity

1. Egypt has significant natural gas production but also relies on liquefied natural gas import due to demand. Unclear of the EEHC's natural gas supply chain with potential of liquefied natural gas exposure

Source: GlobalData

JERA has a significant and growing global renewable energy portfolio and a desire to scale renewables in Hawai'i

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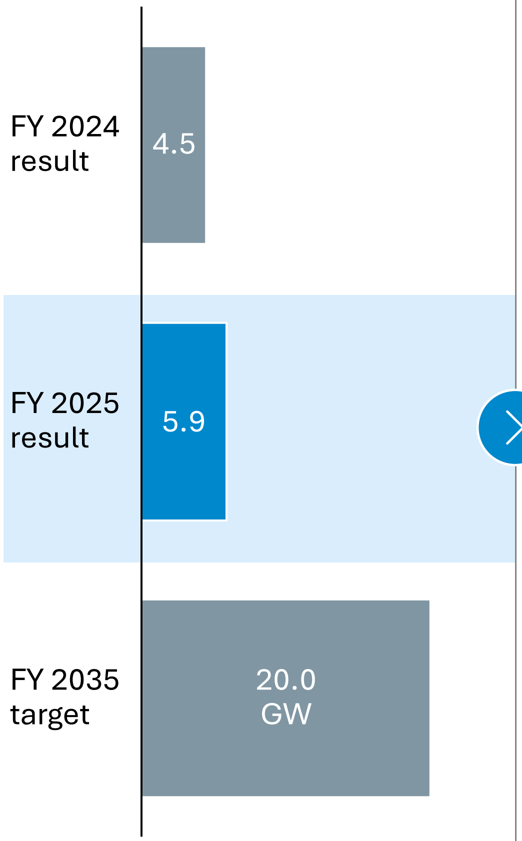
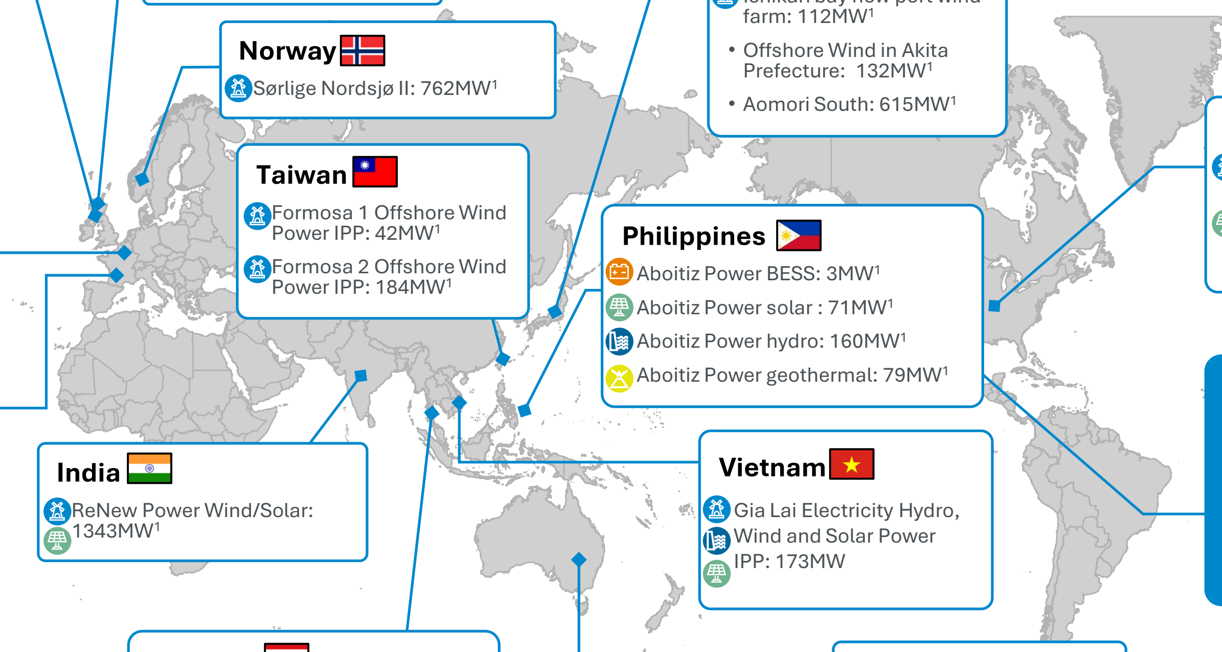
AS OF MARCH 31, 2025

Offshore/onshore wind project | Geothermal project | Solar project | Biomass project | Battery storage project | Hydro project | Hydrogen project

JERA's renewable energy development target, GW



JERA's renewable energy committed project capacity[2,3], MW



UK
- Gunfleet Sands Offshore Wind IPP: 43MW[1]
- Zenobe Battery Storage: 60MW

Ireland
- Oriel wind farm: 281MW[1]

Norway
- Sørlige Nordsjø II: 762MW[1]

Belgium
- Belwind: 137MW[1]
- Nobelwind:68MW[1]
- Northwester: 153MW[1]

Taiwan
- Formosa 1 Offshore Wind Power IPP: 42MW[1]
- Formosa 2 Offshore Wind Power IPP: 184MW[1]

Germany
- Hydrogenious LOHC Technologies Hydrogen Related Project
- Arcadis Ost 1: 180MW[1]

India
- ReNew Power Wind/Solar: 1343MW[1]

Japan
- Ishikari bay new port wind farm: 112MW[1]
- Offshore Wind in Akita Prefecture: 132MW[1]
- Aomori South: 615MW[1]

Philippines
- Aboitiz Power BESS: 3MW[1]
- Aboitiz Power solar : 71MW[1]
- Aboitiz Power hydro: 160MW[1]
- Aboitiz Power geothermal: 79MW[1]

Vietnam
- Gia Lai Electricity Hydro, Wind and Solar Power IPP: 173MW

USA
- El Sauz Wind Power Project: 300MW[1]
- Happy and Oxbow Solar Power Projects: 198MW[1]

Hawai'i

JERA's goal is to help scale renewable deployment in Hawai'i

Thailand
- West Huaybong 2 and 3: 10.35MW[1]
- EGCO wind cumulative: 10MW[1]
- EGCO solar cumulative: 14MW[1]
- EGCO biomass: 1MW[1]

Australia
- BlueMackerel: 752MW[1]

1. Equity output power generation capacity
2. Including operational and under development projects
3. JERA development projects from JERA Nex Bp included only

Source: JERA's business initiatives

Challenges facing O'ahu

(as detailed in HSEO's Alternative Fuel, Repowering, and Energy Transition Study)

O‘ahu energy challenges

Affordability

#50

O‘ahu has the least affordable electricity in the United States

Average retail electricity prices of approximately $0.43/kWh are more than three times the US average

Reliability

>3x

Increase in unplanned outage hours across O‘ahu’s generation fleet over the past decade

Outages on O‘ahu have significantly increased since the closure of the AES coal plant. If no actions are taken and retirements continue as planned, HECO’s IGP grid modelling suggests that O‘ahu will see outages on 73 days per year (greater than 700x the DoE reliability standard)

Sustainability

~2x

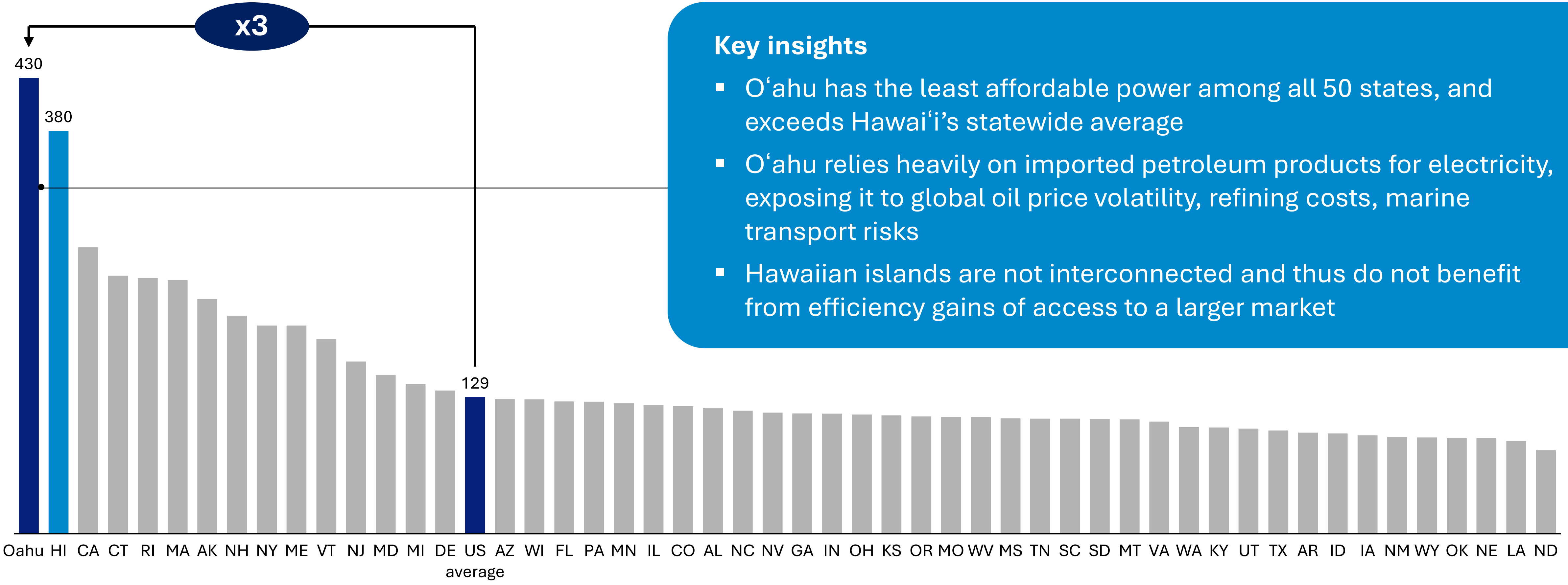
O‘ahu has almost double the average US emissions intensity

With 670 kgCO2e/MWh, O‘ahu alone ranks 8th among U.S. states, trailing only those states that are heavily dependent on coal-based generation. Without upgrades to O’ahu’s aging and inflexible thermal fleet, the ability to integrate additional renewable resources will be constrained by system limitations.

Source: EPA, Ember climate, EIA, Hawaiian Electric Key Performance Metrics – Power supply and generation , HECO IGP 2023

Affordability: O‘ahu has the most expensive power in the nation

Average retail cost of power, $/MWh 2024



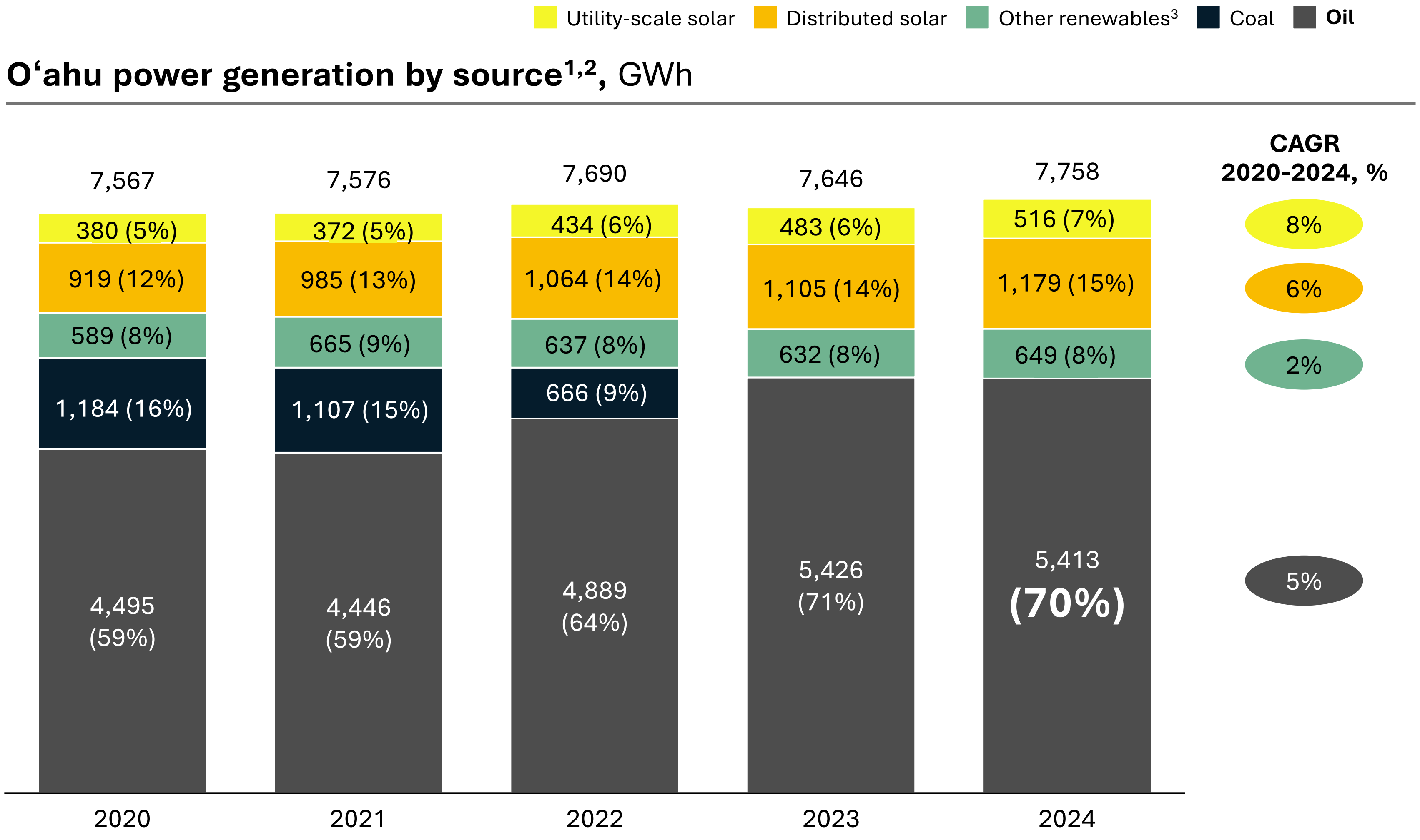
Key insights

- O‘ahu has the least affordable power among all 50 states, and exceeds Hawai‘i’s statewide average
- O‘ahu relies heavily on imported petroleum products for electricity, exposing it to global oil price volatility, refining costs, marine transport risks
- Hawaiian islands are not interconnected and thus do not benefit from efficiency gains of access to a larger market

Source: EIA

O‘ahu generates ~70% of its power from oil, up from ~60% before the closure of the AES coal plant

O‘ahu power generation by source[1,2], GWh



Key insights

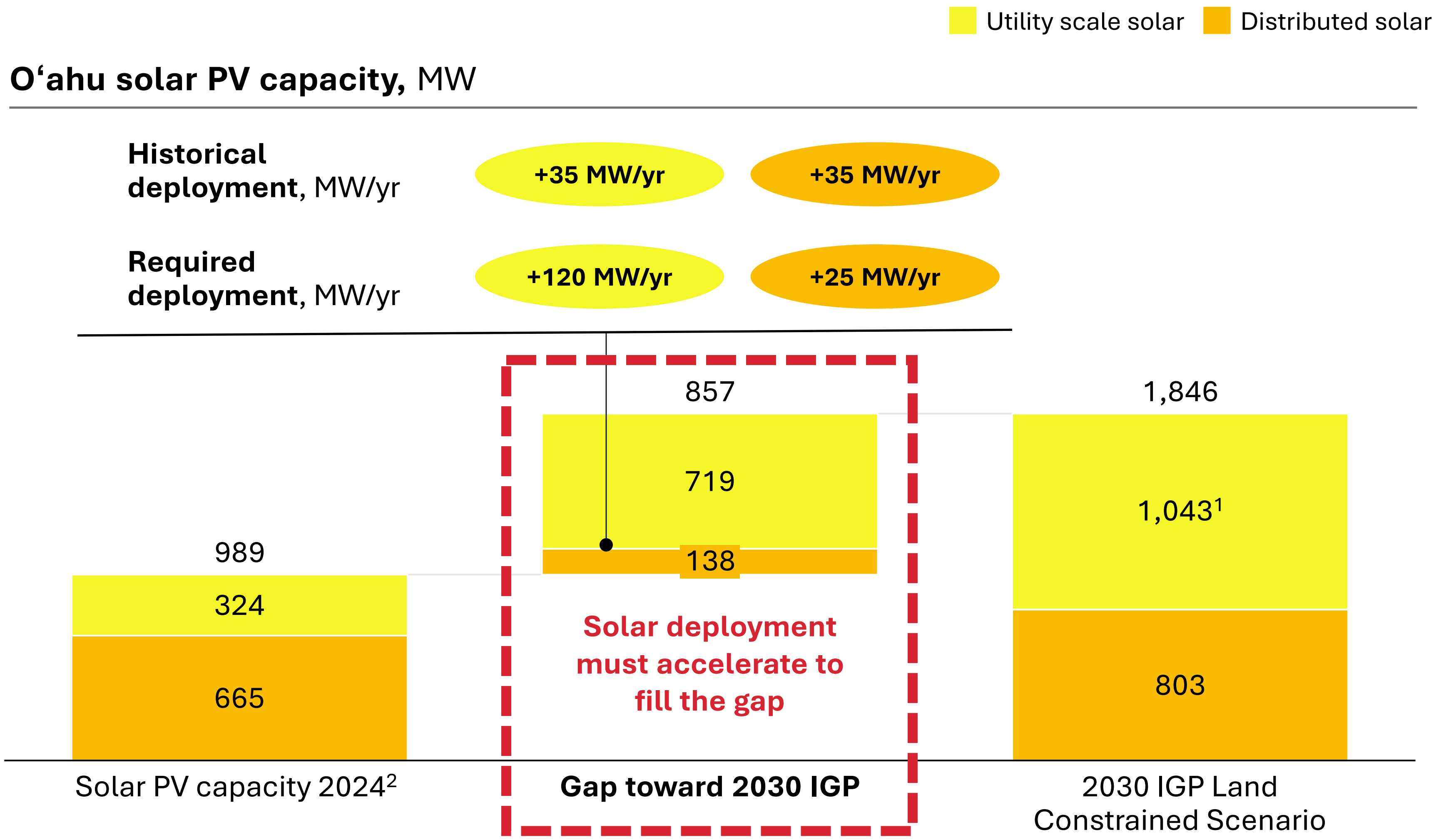
- ~70% of power on O‘ahu comes from imported oil; Hawai‘i is the only oil-reliant state for power generation
- The closure of the AES coal plant in 2022 increased the State’s reliance on oil
- Hawai‘i quickly expanded solar which comprises ~15% of total generation
- Expanding solar will require coordinated action to address land, rooftop and grid limitations. New, flexible generation can accelerate renewables

1. Renewable generation reported by HECO from Feed-in Tariff contracts, IPP agreements, known -sited grid-connected technologies, generation records when available, and estimates made for unavailable recorded data based on reasonable performance assumptions for typical systems
2. Coal and oil-fired generation reported from fuel receipts to EIA
3. Including wind, waste, and biomass

Source: 2020-2024 Renewable Portfolio Standard Status Report, 2024 EIA Fuel Receipts and Cost Time Series File (EIA-923 reports)

Solar deployment must accelerate to meet conservative 2030 IGP goals; responsive firm generation can accelerate PV integration

O'ahu solar PV capacity, MW



Key insights

- O'ahu has ~989 MW of solar today and needs ~857 MW more by 2030; rooftop solar is growing quickly, but large-scale solar is lagging. **The State must further prioritize solar deployment to speed up the pace of deployment**
- Because solar is only effective when the sun is shining, the grid **requires firm capacity to supply power when the sun is not shining**

1. Estimated by assuming that ~449MW of planned renewables in IGP will still be completed (O'ahu added ~136MW of utility-scale solar since the IGP, hence still has 449MW in planning), and an additional 270MW of new hybrid solar will be added bringing the total to 1043 MW (from 324 MW today)
2. End of the year

Source: O'ahu Near-Term Grid Needs Assessment, HECO Power facts, 2020-2025 Hawaiian electric sustainability report and maps

Solar growth will be wasted without thermal modernization

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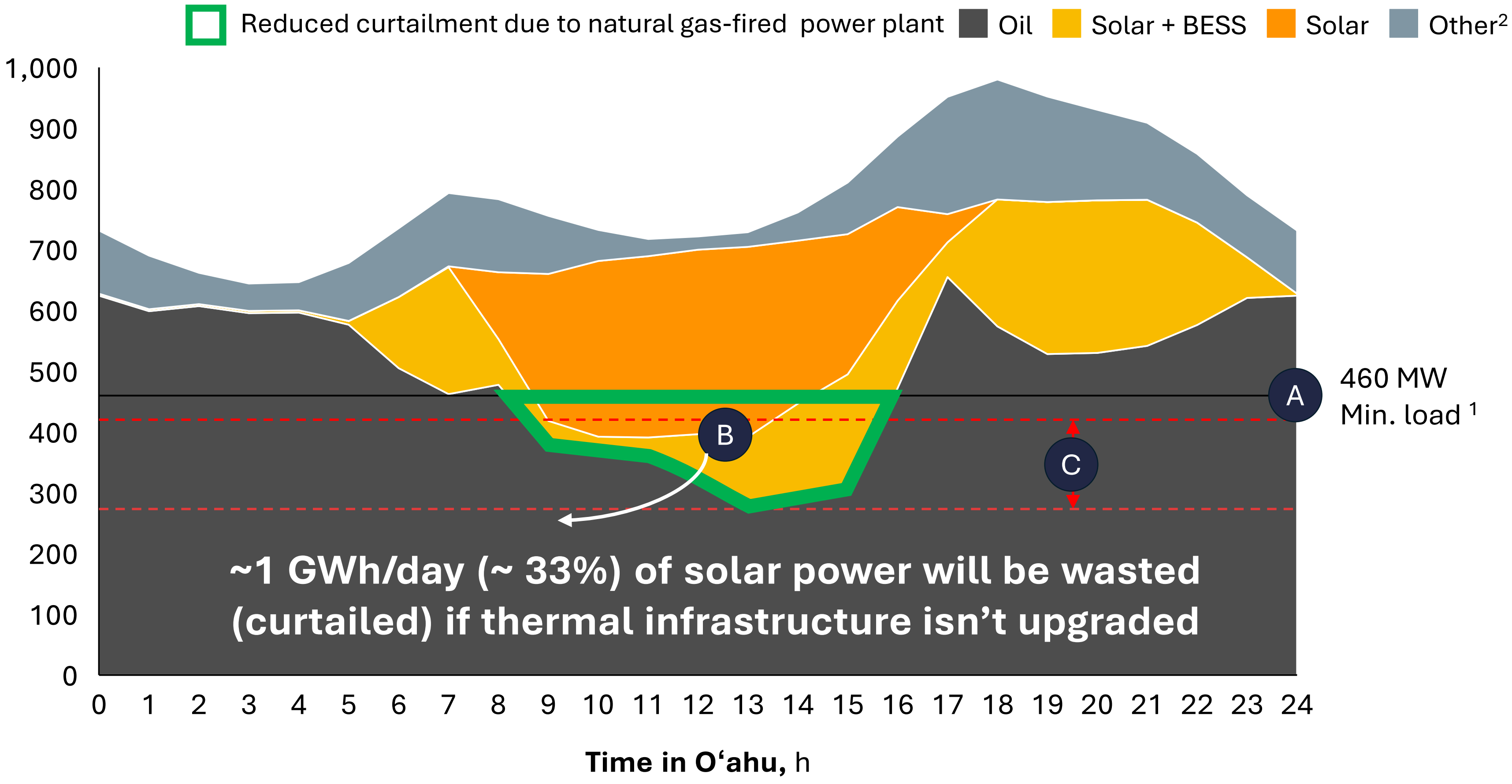
Indicative

O'ahu average generation profile for Nov 2025 with illustrative 3x solar capacity (2030 IGP base scenario), MW



Key insights

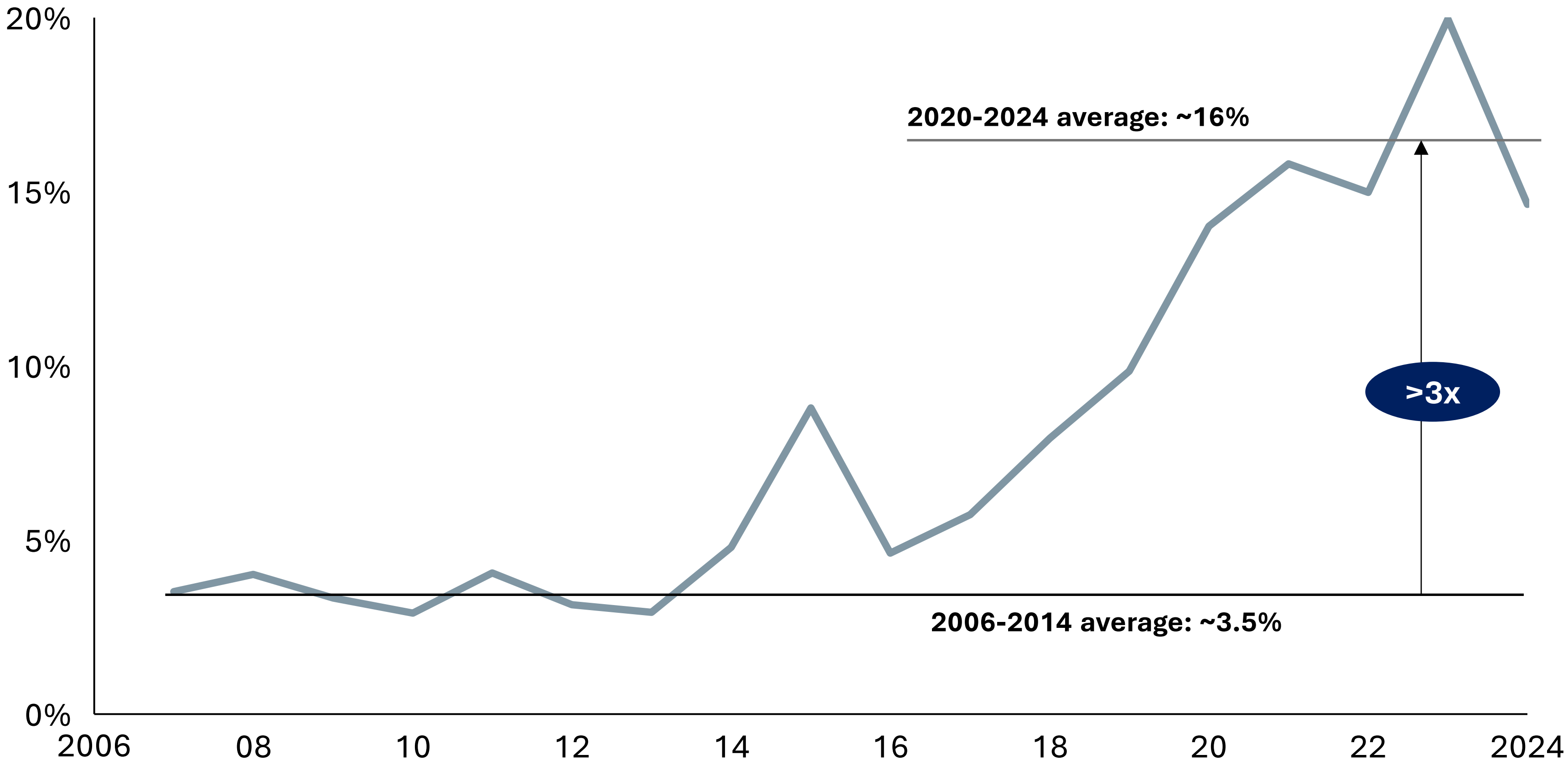
- **A** **O'ahu's oil-fired generators have a minimum load of 460MW.** Below this load level, they would have to shut down, and start-up takes 10+ hours on average.
- **B** If solar capacity were tripled to ~3 GW (as in HECO's 2030 IGP ambition base case), **~1 GWh/day of solar power would be wasted (curtailed)** as oil-fired power plants cannot run below minimum load.
- **C** **A flexible power plant that adjusts output quickly such as a natural gas-fired power plant would eliminate curtailment** as the fast ramp rate would support the intermittent production of renewables and allow further integration of sources like wind and solar.

1. Minimum load determined by the primary fossil-based plants' generation capacity (Kahe, Waiau, Campbell Industrial Park, and Kalaeloa, totaling 460MW)
2. Municipal solid waste/landfill gas, waste oil, biomass liquid, wind, battery

Source: Hawai'i PUC Docket 2021-0024

Forced outages on O‘ahu have more than tripled over the past decade

O‘ahu forced outage factor of full generation fleet[1], %



Key insights

- ‘Forced outages’ are unplanned shutdowns or reductions in plant output, primarily caused by unexpected equipment failures
- Since 2015, O‘ahu has seen a **>3x increase in hours** when its generation fleet was unexpectedly unavailable
- **Forced outages** have increased from ~3.5% during 2006-2014 to ~16% over the last 5 years
- O‘ahu's **thermal power plants** are operating well beyond their expected lifetimes, contributing to **higher outage rates**
- Solar intermittency will further challenge grid reliability

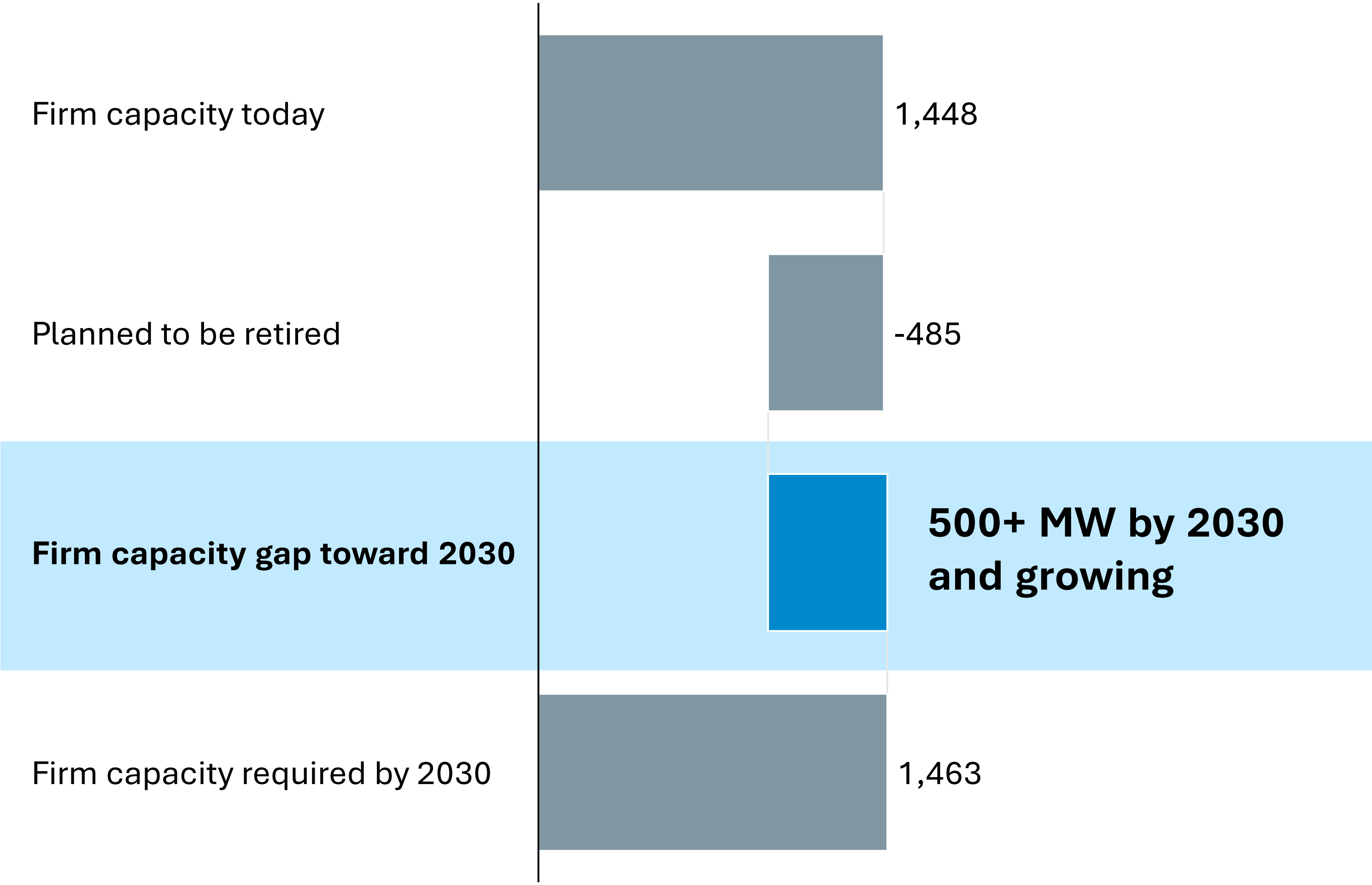
1. WEFOF (weighted average equivalent forced outage factor) is a fraction of a given operating period in which a generating unit is not available due to forced outages and forced deratings

Source: Hawaiian Electric Key Performance Metrics – Power supply and generation

Considerations for firm thermal power to support Hawai‘i’s Energy Transition

HSEO's Study: O'ahu will need 500+ MW of new firm power capacity by 2030

O'ahu firm capacity forecast for 2030, MW



Source: HECO IGP 2023

KEY QUESTION

What is the best way to fill this gap while meeting the State's decarbonization goals?

Baseline assumption — **Solar PV and Battery Energy Storage System** ("BESS") **will be maximized in every scenario.**

What type of firm capacity makes the most sense?

1. What technology should it be?
2. How big should a facility be?
3. How should it be configured?
4. What is the optimal fuel choice, now and into the future?

HSEO's Study: Modern CCGT turbines are ~68% more efficient than the current HECO Kahe and Waiau oil-fired plants

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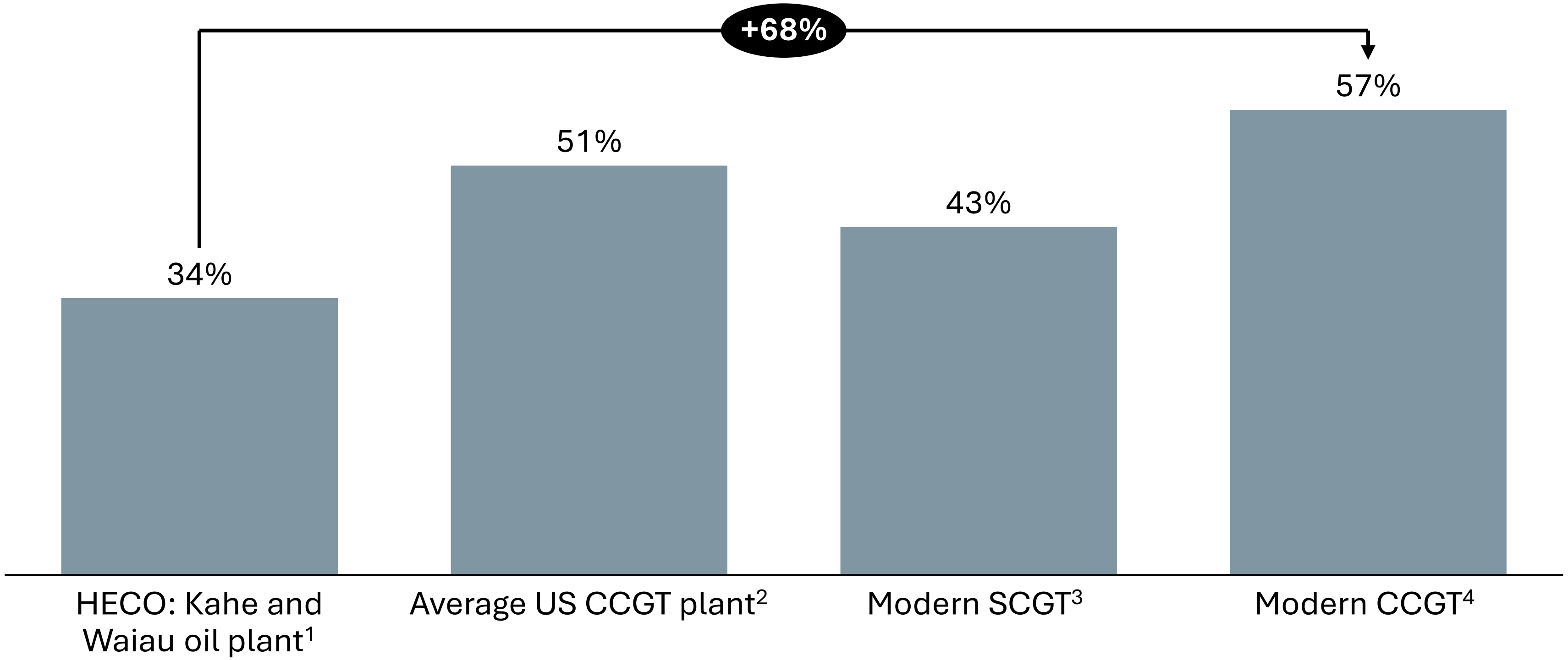
Power plant efficiency (LHV), % of energy input converted into power



1. Converted to LHV based plant efficiency based on average fuel oil heat content
2. Converted to LHV based plant efficiency based on average natural gas heat content
3. GE LMS100 SC net efficiency based on ISO conditions (standardized reference conditions for rating performance, set at 15°C (59°F) temperature, 60% relative humidity, and sea level pressure (101.325 kPa))
4. 2x1 GE 6F.03 CC net efficiency based on ISO conditions (standardized reference conditions for rating performance, set at 15°C (59°F) temperature, 60% relative humidity, and sea level pressure (101.325 kPa))

Key insights

- Kahe and Waiau plants are on average 58 years old and are inefficient, converting only ~34% of the energy input into power
- Nearly every state uses CCGT plants that are more efficient than Kahe and Waiau. The typical US CCGT (on avg. ~19 years old) converts ~51% of energy input into power
- The latest, most efficient CCGT's can convert ~57% of energy input into power, which is ~68% more efficient than what O'ahu uses today

Source: GE gas turbine fact sheet, HSEO Alternative Fuel, Repowering, and Energy Transition Study

A large-scale (~500 MW) power plant reduces capital costs and improves plant efficiency

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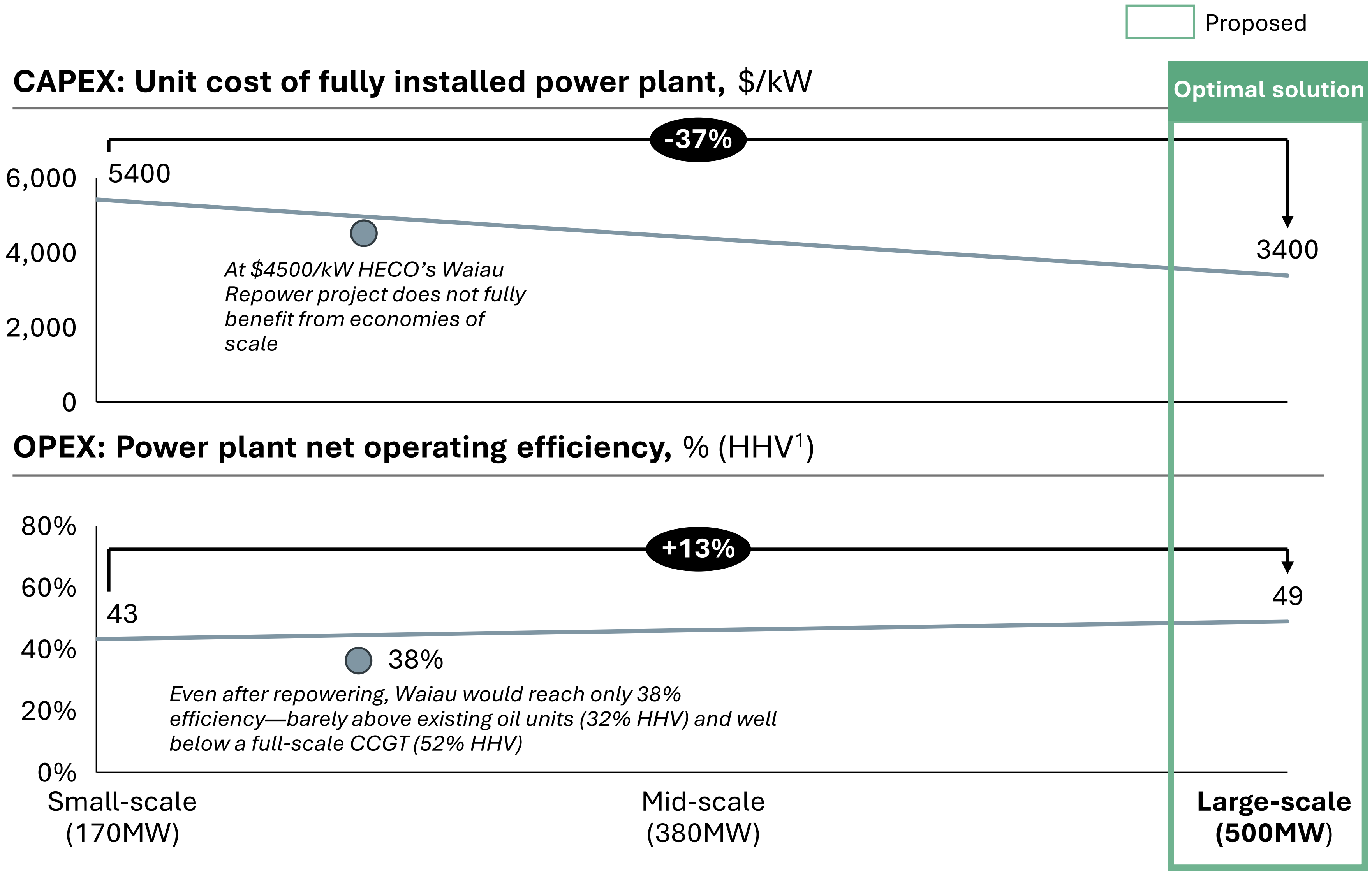

Key insights

A large power plant offers distinct advantages over two separate stations:

- Streamlined project execution through a single site
- Achieves economies of scale with approximately ~37% lower plant unit capex costs
- ~13% improvement in power plant net operating efficiency (higher fuel-efficiency)

1. Higher heating value

Source: JERA, GE Vernova gas turbine fact sheet, Energy velocity

Hybrid configuration is best suited to tackle O'ahu's energy trilemma

Combined cycle/Simple cycle hybrid helps the State achieve **affordability**, **reliability** and **sustainability**

		Optimal solution	
Configuration	Simple Cycle (SC)	Hybrid (CC + SC)	Combined Cycle (CC)
Capital Cost	⊗ Low	⊖ Moderate	✓ High
Efficiency	⊗ Lower	✓ Higher	✓ Higher
Operation Flexibility	✓ Very High	✓ Very High	⊖ Moderate
Start up time	✓ Minutes	✓ Minutes	⊗ 1~3 Hours
Emissions (CO_2/MWh)	⊗ High	✓ Moderate to Low	✓ Low
Footprint	✓ Small	⊖ Medium	⊖ Medium

Key insights

- **Combined cycle/simple cycle hybrid configuration helps the State achieve affordability, reliability and sustainability**
- **Hybrid configuration achieves the best of a combined-cycle and simple-cycle natural gas-fired power plant** with fast ramp rate and high operational efficiency while complying with HECO's single point of failure guidance (max. 142 MW)

What is the optimal fuel choice, now and in the future? All may be needed, but LNG clearly the best bridge fuel for thermal generation

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Based on HSEO Alternative Fuel, Repowering, and Energy Transition Study

	O'ahu today	Alternatives (Future)		
		Optimal solution		
Element	**Oil (LSFO)**	**LNG**	**Biofuel**	**Hydrogen**
Affordability	✗ Volatile prices and high cost	✓ Lower prices and less price volatility	✗ Most Expensive	✗ Commercially not ready yet
Sustainability	✗ Highest carbon emissions	✓ Lower carbon choice than oil that aligns with the State's energy goals	✓ Lower carbon choice than oil	✓ Lowest carbon emission
Fuel Reliability	✗ Imported from high-risk sources	– Mainly imported from low-risk sources	✗ Limited local production, require high-cost imports	✗ Limited local production, require high-cost imports
Commercial Viability Score by HSEO (5/5)	N.A.	✓ **5.00**	– 2.85~3.15	– 2.60~3.15

- Commercial Viability Score consists of **Production Scalability** (35%), **Technology Readiness Level (TRL)** 30%, **Fuel Availability** (20%), and **Transportation Logistics** (15%). Its total score is 5.00.

Key insights

- HSEO's Study identified **LNG** as a key component of lowering the State's carbon emissions and promoting additional renewable energy integration onto the grid
- **LNG has both lower prices and less price volatility than oil (LSFO)** making it a potential mechanism to address high energy prices and Hawai'i's affordability challenges
- Combustion using fuels like LNG, biodiesel, RNG, and hydrogen must be considered to balance the further adoption of renewable energy sources

1. Based on HSEO Alternative Fuel, Repowering, and Energy Transition Study, Jan. 2025

Proposed pathway: A larger, hybrid natural gas-fired power plant is the optimal solution

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Element	O‘ahu today: Oil-fired generator[1]	Proposed alternative (Optimal solution): Natural gas-fired power plant
Stability	(–) Current O‘ahu oil-fired generators (e.g., Kahe, Waiau) are old and less reactive with inertia for grid support	(✓) Synchronous generator and modern controls
Firmness	(✓) Dispatchable and able to supply firm capacity	(✓) Dispatchable and able to supply firm capacity
Fuel reliability	(✗) No local production; oil mainly imported from high-risk sources	(–) No local production but gives fuel flexibility; liquefied natural gas mainly imported from low-risk sources
Fast ramping	(✗) Oil-fired turbine ramps up slowly	(✓) Quick start up and fast ramp rate; exact ramp rate dependent on type of turbine

Key insights

- Natural gas-based power can provide fast-start and fast-ramp capability to integrate more solar power; can also address the high outage rates stemming from aging oil-based generation
- The supply security challenge can be mitigated through stable long-term liquefied natural gas offtake contracts
- Natural gas-fired plant can be built to transition to clean fuels, minimizing the risk of stranded assets and fossil lock-in

1. Based on Hawai‘i's current major fossil-based firm generation (i.e., Kahe, Waiau, Campbell industrial park, Kalaeloa Partners)

Source: EPA, FERC, EIA, USGS

JERA’s proposed approach

JERA is committed to Hawaiʻi for the long run, and envisions a long-term partnership that includes accelerating renewable deployment

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Two pillars of JERA's proposed approach:

1 Deliver and operate natural gas infrastructure and power plant

- **JERA and local partners** will deliver the liquefied natural gas and natural gas-fired power plant project
- LNG (natural gas) can replace oil as the primary generation fuel in the near-term to lower costs, reduce carbon emissions, and strengthen grid reliability while **upgraded thermal infrastructure enables a future transition to clean fuels**

THIS PROPOSAL'S FOCUS

2 Support accelerated renewable deployment

- Beyond this proposal, **JERA is actively looking to invest, support, and enable renewable energy projects through partnering with local companies and developers**
- JERA will seek to bring capabilities developed across its **6GW global renewable portfolio** and engage with and learn from **energy and community leaders in Hawaiʻi**

FUTURE FOCUS

JERA net zero commitment

- JERA is committed to net zero emissions from domestic and international operations by 2050
- JERA is active on the mandatory Japanese carbon market, which sets a price on carbon to achieve Japan's national net zero commitment
- JERA has established country-specific roadmaps to incorporate more renewables and switch to lower-carbon fuels in thermal power plants

Proposed LNG infrastructure and natural gas-fired power plant project on Oʻahu

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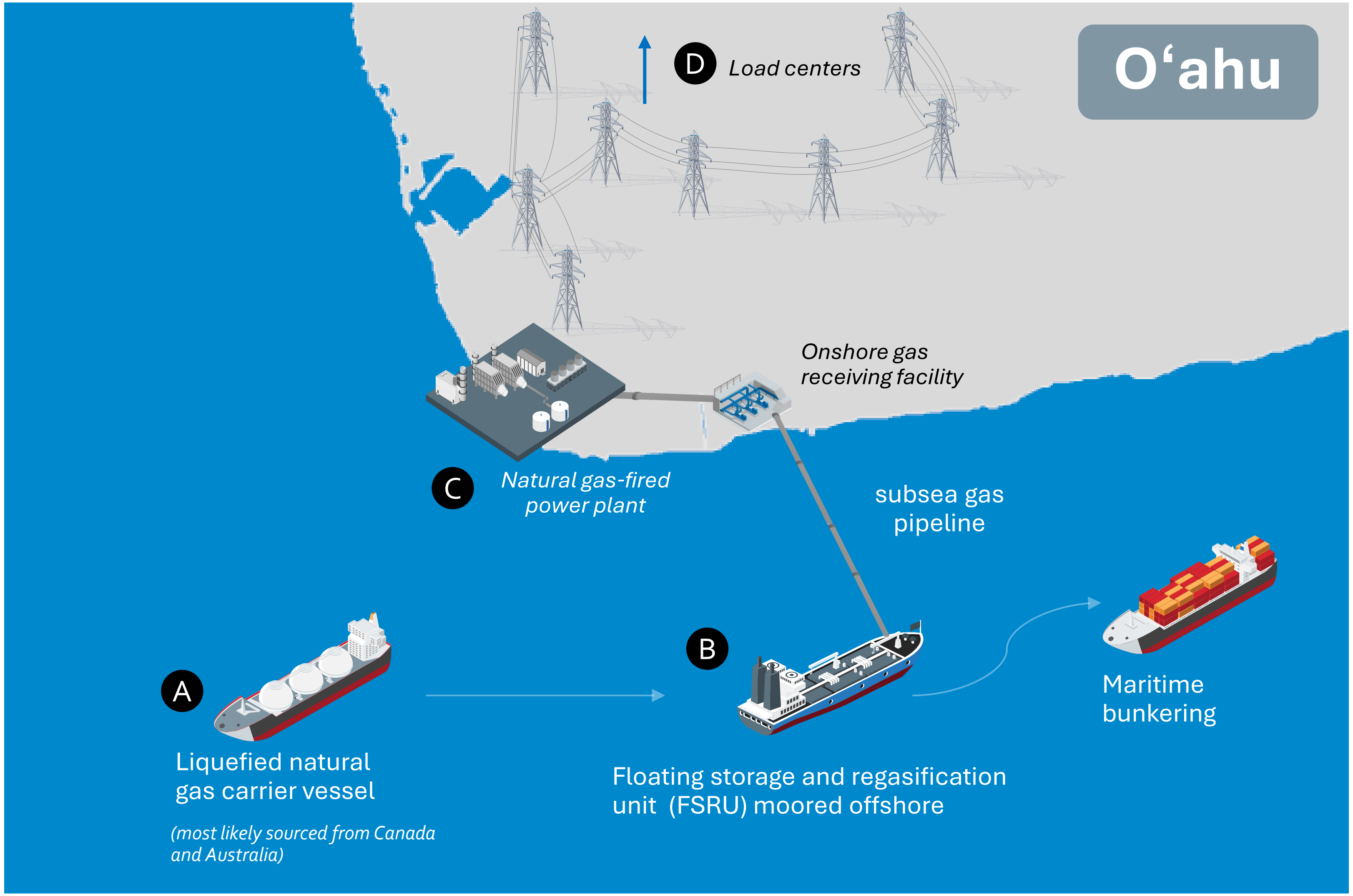

LNG infrastructure

A Liquefied natural gas can be procured from the source that offers the best combination of price and sustainability then shipped to Hawaiʻi in compliance with Jones Act

B Liquefied natural gas will be transferred from the carrier vessel onto the FSRU to be regasified, then piped toward land and received at the onshore gas receiving facility

The FSRU can also supply the maritime industry with bunkering fuel

Natural gas-fired power plant

C A ~500 MW natural gas-fired power plant would be fed by an onshore gas pipeline

D The produced power would be transmitted to the load centers on Oʻahu

Source: JERA Longboard LNG FSRU Terminal Phase 2 Basis of Cost and Schedule Estimate

A large-scale natural gas-fired power plant is more affordable as it has higher fuel-efficiency and lower unit capital costs vs. sub-scale plants

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Illustrative rendering of the JERA hybrid natural gas plant at a potential site identified in HSEO's study

Produces affordable power through significantly higher fuel efficiency and lower unit capital costs (vs. Waiau repower)

Located in an industrial area, minimizing any need to construct near nature or residential areas

Creates fuel flexibility to run on multiple sources including clean hydrogen and clean ammonia

1. Turbine models and combined-cycle configuration are indicative only. Final vendor selection and optimal block configuration will be determined during detailed engineering

Source: JERA

The new natural gas-fired power plant will integrate into O‘ahu’s existing power system

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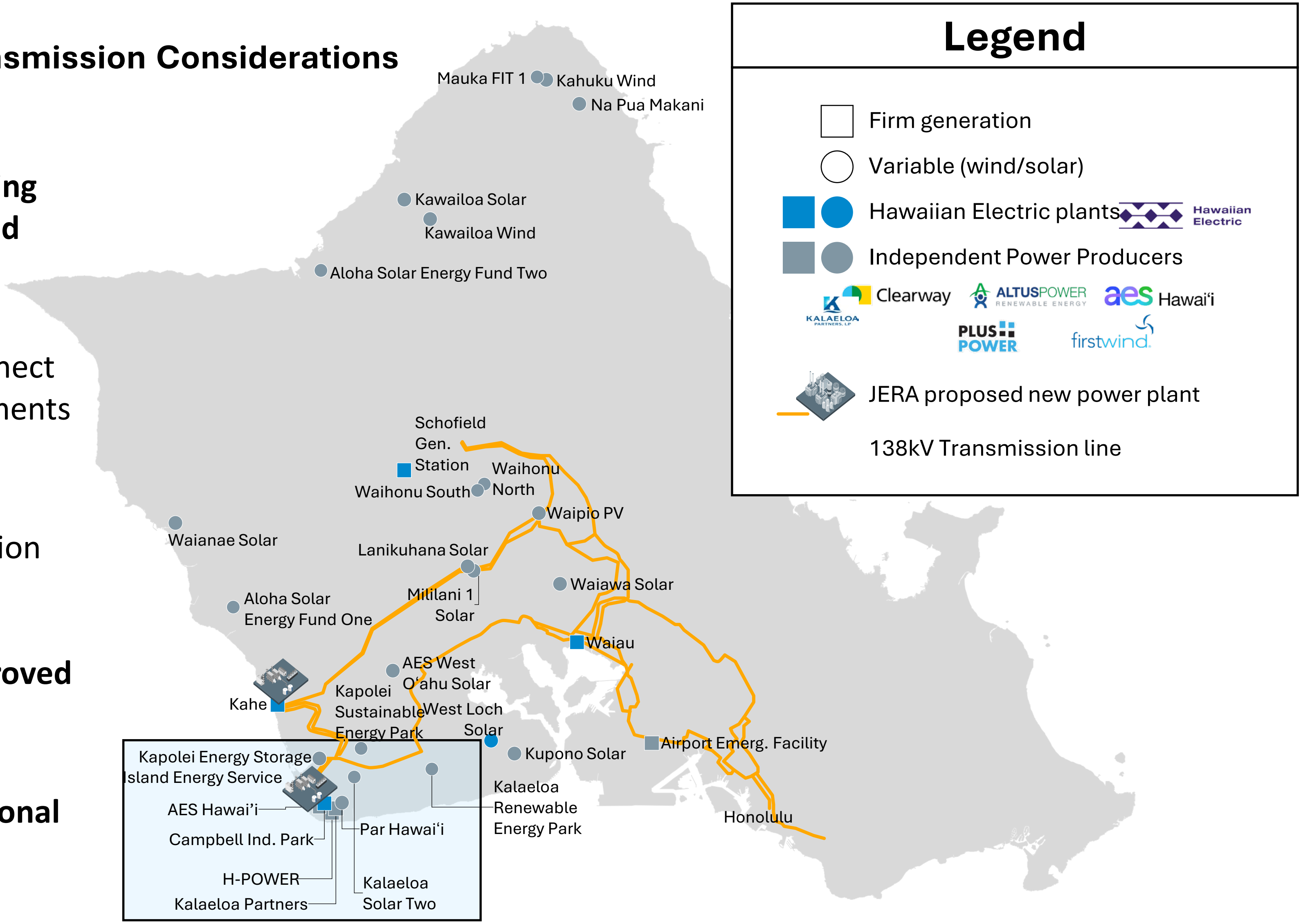
System Planning, Interconnection, and Transmission Considerations

- The proposed generation facility has been developed within the context of **O‘ahu’s existing transmission network, system constraints, and long-term grid planning assumptions**
- Our evaluation recognizes that **transmission upgrades will be required** to reliably interconnect and dispatch the resource, and these requirements have been **incorporated into the overall investment framework**
- Final interconnection configuration, transmission scope will be refined through **applicable interconnection studies and transmission planning processes**, consistent with **PUC-approved process**
- The intent is to deliver a **system-compatible resource that supports reliability and operational flexibility**



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Multiple configurations, technologies, sites and routes were evaluated with experts to develop optimal approach for O'ahu

1. **Designed to optimize cost and efficiency for O'ahu**
   Right-sized and purpose-built for O'ahu to balance scale efficiency with operational performance. A hybrid configuration combines efficient baseload operation with fast-response capability to maximize value for customers.

2. **Engineered to avoid single-point-of-failure risks**
   Redundant and modular design using proven practices to reduce outage risk and strengthen system reliability during peak demand or stress events.

3. **Built to load-follow and support renewable integration**
   Designed for fast start, rapid ramping, and load-following to respond dynamically to changes in renewable generation.

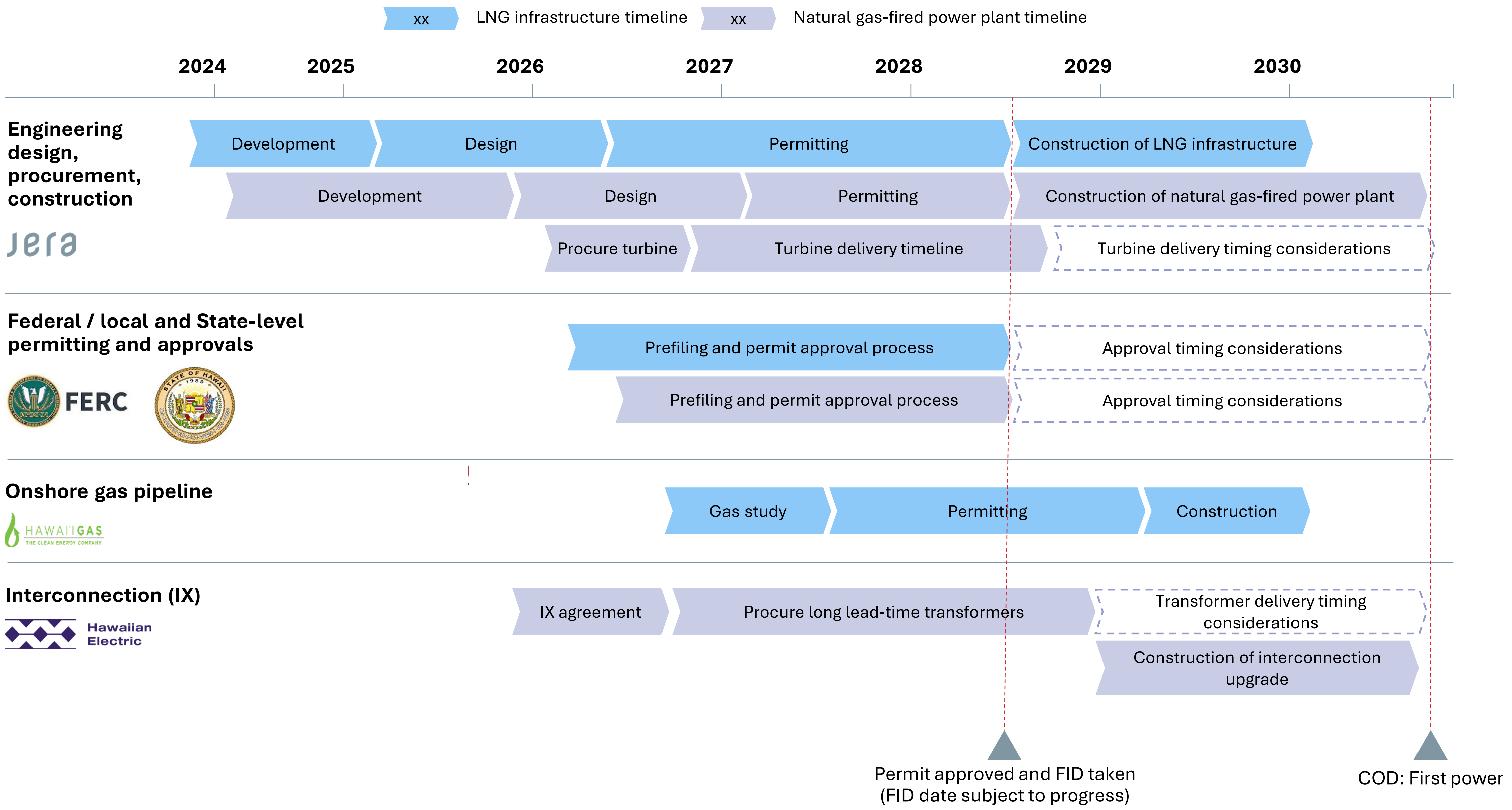
4. **Fuel-flexible into the future**
   Designed for future fuel adaptability, helping avoid long-term fossil lock-in. Most project investments remain usable with clean fuels as Hawai'i's energy mix evolves.

5. **Uses robust, proven equipment**
   Based on commercially proven, globally deployed power generation technologies selected for reliability, performance, and maintainability.

6. **Multiple feasible routing options, stress-tested**
   Routing options assessed for feasibility, constructability, and environmental sensitivity, with alternatives stress-tested to identify and mitigate risks.

7. **Backed by JERA's global power plant experience**
   JERA's global experience in power generation and LNG-to-power systems supports the credibility of the technical and economic analysis.

Optimized project timeline to accelerate benefits for the State of Hawai'i



Benefits for Hawai‘i

The economic case is robust, even under shorter amortization timelines and potential cost overruns

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Baseline Annual Savings vs. Oil

$170M[1]

20% vs. Oil
(Average $500/year per household)

- Including all infrastructure costs
- Assuming LNG goes away at **2045**
- Assuming thermal plants switch to renewable fuel at 2045
- **~$170M**/year vs. oil increases to **~$510M**/year vs. biofuels
- Volume assumption of 0.55 MTPA LNG

Additional Annual Savings

$25M[2]

from Inclusion of Bunkering Volume
(Average $70/year per household)

- Sharing LNG FSRU infrastructure costs with bunkering market further enhances savings for people in Hawai'i
- 0.4 MTPA increase in volume
- Includes the required investment into a Jones Act compliant LNG bunkering vessel

LNG infrastructure is paid back in less than 2 years

Economics remain attractive even in the event of significant delays; For example, a 3-year delay still results in ~$130M[3] annual savings

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Economics remain attractive even in the event of Capex overruns; For example, a 20% increase in CAPEX still results in ~$140M[4] annual savings

1. Key Financial Model Assumptions for natural gas project: 40-year project life, estimated 2.8 TWh of annual generation, 50/50 debt-to-equity financing
2. Average reduction in estimated total revenue requirement over 40-year life of power plant
3. Assumes ~9% increase in delivered fuel cost due to 3-year COD delay for LNG infrastructure
4. Assumes 20% increase in upfront capital costs for both LNG infrastructure and power plant

Fuel flexibility: ~90% long-term infrastructure value with no fossil lock-in

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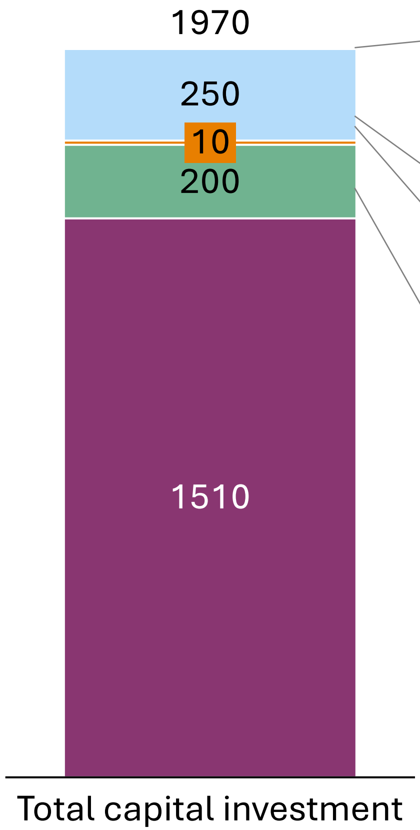
Legend: Fixed infrastructure | FSRU | Onshore pipeline | CCGT & SCGT

✓ Redeployment ready ⋰ Potential to redeploy ✗ No redeployment potential

Total capital investment, $M

Capital cost[1]



Component		Potential for redeployment
Subsea pipeline, Mooring system, and ORF	⋰	▪ Repurposed to receive clean fuel if a new clean fuel FSRU is developed
	✗	▪ Decommissioned post-2045 if no alternative fuel imported with the re-deployment of the FSRU
Onshore pipeline	⋰	Repurposed to deliver clean fuel with modification
FSRU	✓	Stay on location and continue to supply liquefied natural gas for marine bunkering (e.g., act as a floating gas station); sell or redeploy the FSRU to other location(s)
Natural gas-fired power plant (SCGT and CCGT)	✓	• GE F class combined cycle is ready to be adapted to renewable natural gas and potential clean hydrogen or clean ammonia operation with limited upgrades • GE LMS aeroderivative turbines able to be retrofitted for hydrogen operation

~90% of capital still productive post-2045

Key insights

- ~90% of capital investments are directed toward components with redeployment potential, such as CCGT and SCGT, onshore pipelines, and FSRU to minimize the risk of stranded assets
- Stranded investments are minimal; most LNG terminal equipment is recoverable upon FSRU redeployment

1. Including EPC, Procurement, Construction, Installation, Capital Spares and, Freight; Excluding Custom and duties, Insurance, design allowance and contingency

Source: 200452-042-0100-KBR-ENG-EST-00001 Phase 2 Cost Estimate Revision 0

A natural gas-fired power plant will advance the Oʻahu power system toward all 3 core objectives

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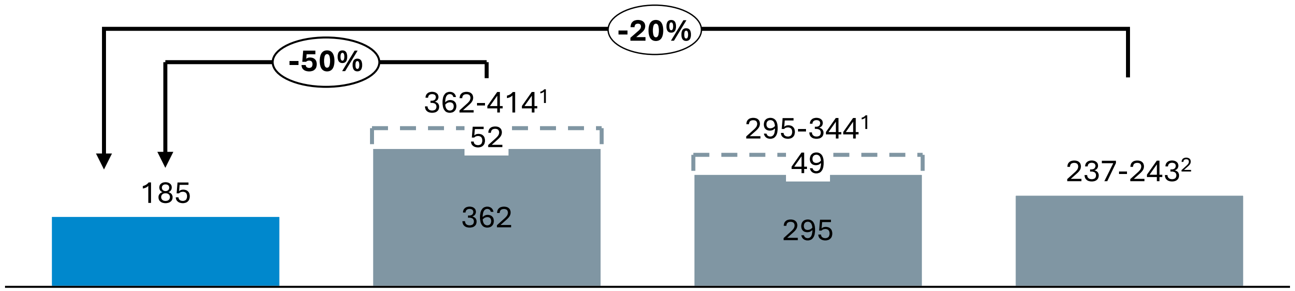
Comparison of firm capacity options for Oʻahu

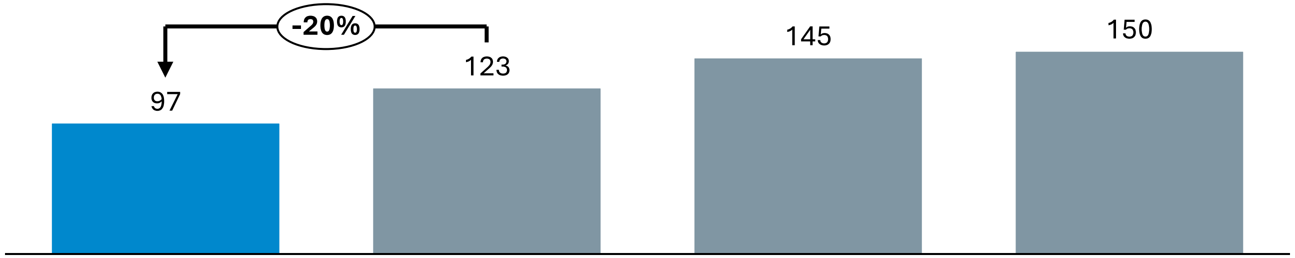
Oʻahu power system objectives | **JERA (Natural gas)** | **Waiau repower (biofuel)** | **Waiau repower (biofuel + oil)** | **Kahe (Oil)**

Affordability: pre-tax LCOE, $/MWh

Note: Generation is only part of the power bill



Sustainability: Cumulative greenhouse gas emissions from now to 2045, million metric ton CO2e



Reliability: Flexible capability and energy security

JERA (Natural gas)	Waiau repower (biofuel) / Waiau repower (biofuel + oil)	Kahe (Oil)
✓ Natural gas-based power using simple cycle or combined cycle gas turbines is fast ramping	✓ Biofuel-based power using simple cycle or combined cycle gas turbines is fast-ramping with either biofuel or oil	✗ Existing oil-based power using steam turbines is slow-ramping
✓ Natural gas-fired power plant enables fuel flexibility	✓ Biofuel-fired power plant enables fuel flexibility for dual fuel operation	✗ Oil-fired generators are ~60 years old and inflexible
✓ Natural gas can provide long-term offtake certainty	✗ Large reliance on foreign oil remains due to delay in biofuels implementation (2045 operation with biofuel claimed by Waiau repower)	✗ Large reliance on foreign oil remains

Key insights

- **More affordable:** Natural gas-based power is less expensive than fully depreciated oil-based power (~20%), and imported biofuels (~50%)
- **More sustainable:** Lower cost natural gas replaces oil faster versus biofuel scenario where expensive fuel is implemented slower. This reduces cumulative CO_2 emissions through 2045 by 20%
- **More reliable:** Fast-start, fast-ramp natural gas generation stabilizes the grid and enables greater renewable integration

1. Range depends on capacity factor of Waiau repower. Lower end of range is a capacity factor of 74% (similar to natural gas-fired power plant), and higher end of range is a capacity factor of 40% (based on typical simple cycle combustion turbine capacity factor as baseload), assuming 40 years of operation; 2. Range depends on the level of maintenance capex required

Source: Alternative Fuel, Repowering, and Energy Transition Study, NREL, Hawaiʻi PUC Docket 2021-0024, JERA, Hawaiʻi PUC Docket 2025-0211 2025-03-28 HECO Waiau Repower Application

Natural gas–fired generation delivers ~45% lower emissions than oil and ~20% lower than biofuels

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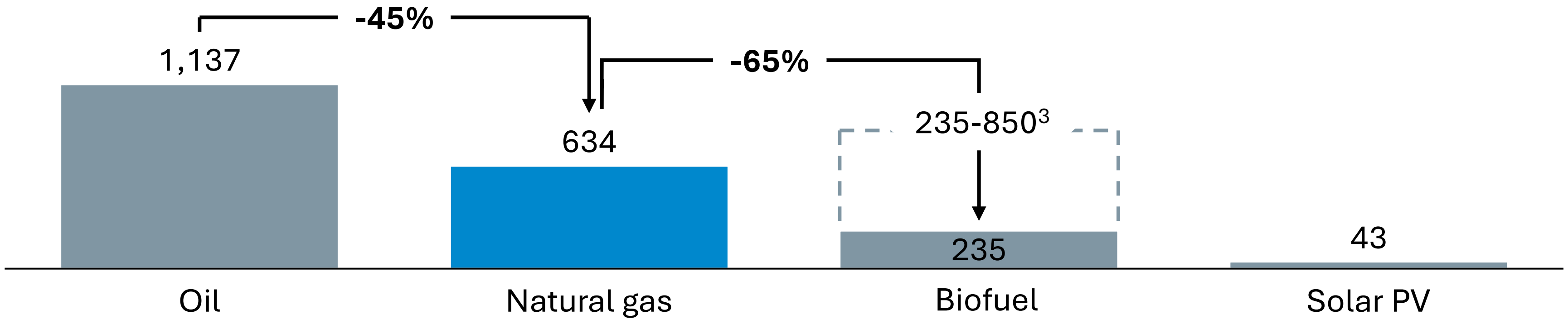
Lifecycle greenhouse gas emissions[2] by source, kg CO2e/MWh



Key assumptions

- Oil is imported
- Based on current EPA's Hawaiʻi (HICC) power plant efficiency of 32%

- Liquefied natural gas is imported from a low-methane leakage source
- Per HSEO's study and modeled natural gas-fired power plant efficiency of 46%

- Based on modeled biofuel efficiency of 32.3% from EPA in Hawaiʻi (HICC)
- Emissions intensity based on Pacific Biodiesel Technologies local production using imported tallow[1] (235, used for emission model) and EPA approved palm oil-based biodiesel (850)

- Solar PV module is imported from outside of Hawaiʻi
- Lifecycle emission factor based on photovoltaic, including one-time upstream, ongoing non-combustion, and one-time downstream, as outlined in NREL analysis

Key insights

- Natural gas–based power reduces emissions nearly in half compared to oil
- While tallow-based biofuels are ~65% less emissive, the faster scalability of natural gas leads to ~20% lower total emissions through 2045
- The natural gas lifecycle emissions profile covers the full lifecycle greenhouse gas of liquefied natural gas from production to regasification and combustion
- The 634 kg CO2e/MWh number assumes liquefied natural gas is sourced from a low methane leakage source (e.g., Canada, Australia)

1. Lifecycle emission based on PBT's historical sourced tallow from the continental US
2. Lifecycle emissions for upstream production, transportation to Hawaiʻi, midstream refining or conversion and downstream combustion are all included
3. Upper range sourced from Palm Oil assuming EPA approved pathway using HICC efficiency

Source: HSEO Alternative Fuel, Repowering, and Energy Transition Study, NREL, Pacific Biodiesel Technologies (PBT) Biodiesel Contract GHG Analysis. January 2022. Hawaiian Electric submission to PUC Docket 2022-0014

Lower cost natural gas replaces oil faster— vs biofuel scenario where expensive fuel is implemented slower

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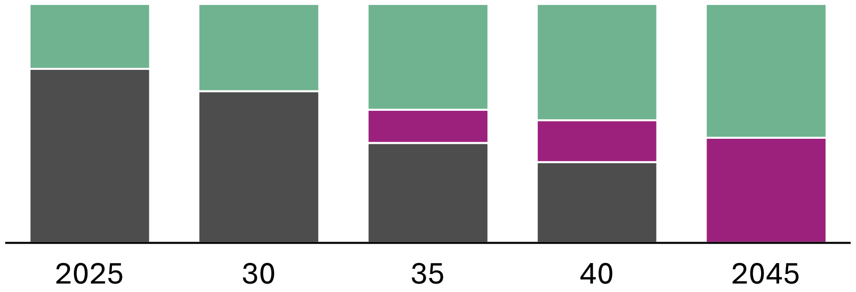
O'ahu modeled generation mix

Renewable | Biofuel | Natural gas | Clean fuel | Oil

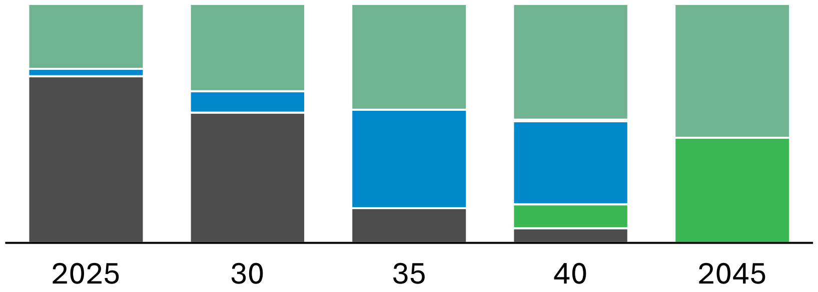
Biofuel scenario

Due to scalability constraints, biofuels (from tallow) replace oil narrowly only to meet the State's decarbonization goals targets. Until 2045, oil remains a significant source



Natural gas scenario

Natural gas can rapidly replace oil post-2030 as it is more economical. Clean fuels are blended in to meet the State's decarbonization goals



Assumptions

- All biodiesel is produced by Par Biodiesel Technologies; local production uses imported tallow with lifecycle emission of 235 kgCO2e/MWh
- Clean fuel; imported hydrogen via ammonia carriers with lifecycle emissions of 350 kgCO2e/MWh and liquefied natural gas imports at 634 kgCO2e/MWh

- Net zero for O'ahu by 2045; 100% light-duty vehicle fleet and 50% freight vehicles are electric by 2045; 13.5 TWh load required
- All oil-fired generation replaced by clean fuels to meet the State's decarbonization goals by 2045

Key insights

- While biofuels have lower emissions per MWh, their slower adoption delays oil replacement, resulting in higher cumulative emissions through 2045 compared to natural gas
- Lower cost natural gas enables fast, large-scale replacement of oil post-2030, with clean fuels blended over time to meet the State's decarbonization goals
- A gas-led transition achieves earlier emissions reductions reliably while supporting renewable growth

Source: HSEO Alternative Fuel, Repowering, and Energy Transition Study, NREL

Using natural gas would lead to ~20% lower cumulative emissions through 2045 vs. relying on biofuels

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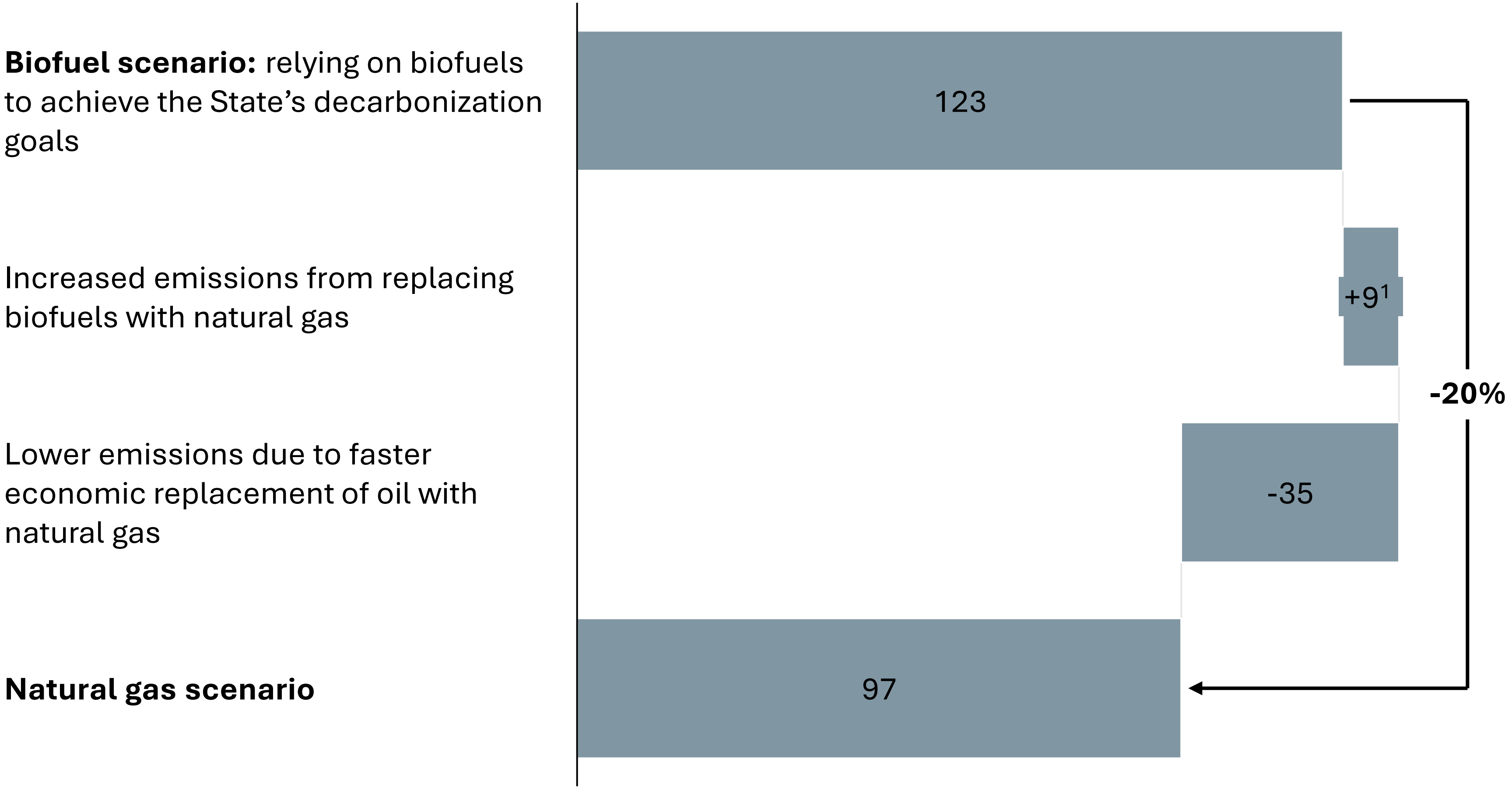
Cumulative greenhouse gas emissions from 2025-2045, million metric tonnes CO2e



Key insights

- **Natural gas leads to ~20% lower emissions overall;** it can economically replace oil at scale. Biofuels cannot displace oil as quickly; a biofuels scenario would cumulatively emit more until 2045
- Replacing biofuels with natural gas would initially result in higher emissions because natural gas is more emissive per MWh than using biofuels from tallow (~634 kg CO2e/MWh vs. ~235). This conservative projection assumes tallow-based biofuel will meet power generation needs by 2045, with additional biofuel imports from other sources further widening the emissions gap

1. Based on ~30 TWh of biofuel-based generation between 2025 and 2045

Source: HSEO Alternative Fuel, Repowering, and Energy Transition Study, NREL, JERA report on Hawaiian power system

The ~$2B investment will increase GDP by ~$150M/yr, and create >1.1k high-quality jobs to O'ahu during the ~5 years of construction

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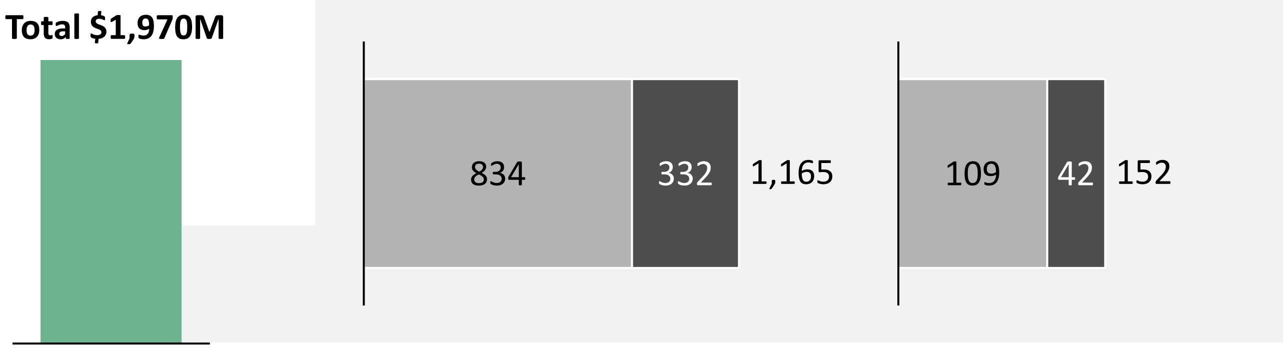
LNG infrastructure | Power plant

During construction (5 years)[1]

Total investment, $M over 5 years

Annual jobs created during construction, number of jobs

Annual GDP added to O'ahu, $M/yr

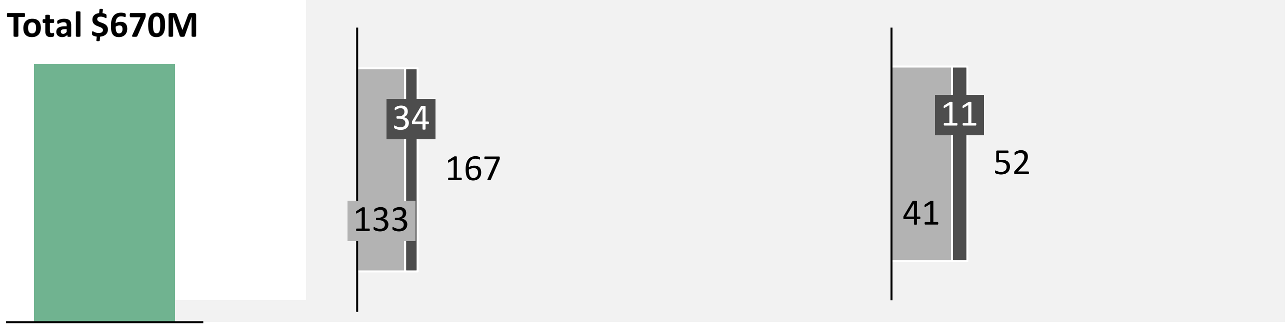


During operation (20-40 years)[2,3]

Total annual cost of service, $M/yr

Permanent jobs created during operation, number of jobs

Annual GDP added to O'ahu, $M/yr



Key insights

- The project will attract ~$2B in investment, and drive ~$150M annually in GDP growth during its 5-year construction; more than 1,100 high-skill temporary jobs created for 3-5 years
- ~170 jobs created and ~$50M GDP annually to operate the power plant for 40 years

1. Exclude imported equipment, tax estimates, project contingency and design allowance, and insurance; FSRU constructed in 3 years and power plant constructed in 5 years
2. Exclude fuel-related operating costs (reliance on imports), depreciation, tax estimates, and grid upgrade (pass-through payments)
3. FSRU operation of 20 years and CCGT operation of 40 years

Source: JERA, U.S. Bureau of Labor Statistics, Lightcast

Proposal summary

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- The State of Hawaiʻi is facing an energy crisis with rising prices, declining reliability, and high CO_2 emissions
- With a mandate to address these challenges, HSEO studied available fuel and generation technologies, and laid out a bold plan to upgrade the existing thermal infrastructure
- Inspired by the vision of the HSEO study, JERA entered into a strategic partnering agreement (SPA) with the State aimed at addressing Oʻahu's energy trilemma: affordability, sustainability, and reliability
- Today, JERA working with local partners, is proposing to invest ~$2B to develop a ~500MW natural gas-fired power plant and offshore LNG import infrastructure
- Through the proposed project, JERA estimates that Hawaiʻi residents and businesses can save $170M a year compared to the cost of existing oil-fired generation, while reducing carbon emissions by approximately 20%
- Despite high renewable adoption statewide, the historic pace of solar development will not achieve the State's decarbonization goals. A modern, efficient generating facility, powered by natural gas will help close the gap by strengthening grid reliability and enabling greater renewable integration
- Up to 90% of the proposed total investment is in fuel-flexible and re-deployable infrastructure, which eliminates the risk of stranded assets and prevents long-term fossil fuel lock-in

Energy for a New Era

Glossary (1/2)

	Term	Explanation
Technical terms	**SCGT (Simple-cycle gas turbine)**	A power plant that produces electricity using only a gas turbine, typically used for peaking due to fast start-up
	CCGT (Combined-cycle gas turbine)	A power plant that generates electricity using a gas turbine and a steam turbine in sequence to maximize efficiency
	LNG (Liquefied Natural Gas)	Natural gas cooled to a liquid state for efficient storage and long-distance transportation
	LSFO (Low-Sulfur Fuel Oil)	A type of fuel oil with a sulfur content of 0.5% or lower, commonly used in maritime and industrial applications to comply with environmental regulations
	FSRU (Floating Storage and Regasification Unit)	A floating facility that stores liquefied natural gas and converts it back into gas for delivery to onshore pipelines
	ORF (Onshore Receiving Facility)	A land-based LNG terminal that receives liquefied natural gas, stores it, regasifies it, and delivers natural gas into the pipeline system
	LCOE (Levelized Cost of Energy)	The average total cost of generating electricity over a plant's lifetime per unit of energy produced
	COD (Commercial Operation Date)	The date on which a facility has completed testing and is officially declared fully operational for commercial service
	BESS (Battery Energy Storage System)	A system of batteries and associated equipment used to store electricity and discharge it later to provide energy, capacity, or grid services
	FEED (Front-End Engineering Design)	The detailed engineering phase that defines a project's technical scope, cost estimate, and execution plan prior to final investment approval
	FID (Final Investment Decision)	The formal decision by project sponsors to commit capital and proceed with project execution based on finalized technical, commercial, and financial terms
Units	**MWh (Megawatt-hour)**	A unit of energy equal to one megawatt (10^6) of power supplied for one hour
	TWh (Terawatt-hour)	A unit of energy equal to one terawatt (10^9) of power supplied for one hour
	MMBtu (Million British Thermal Units)	A standard unit of energy commonly used to measure natural gas volumes
	GW (Gigawatt)/MW (Megawatt)	A unit of power commonly used to express large-scale generation capacity
	MTPA (Million Tonnes Per Annum)	A unit of capacity used to measure annual fuel production, export, or import volumes

Glossary (2/2)

	Term	Explanation
Stake-holders	**HSEO (Hawaiʻi State Energy office)**	State agency dedicated to leading Hawaiʻi's transition to a 100% clean energy economy by developing policies and programs that promote energy efficiency, renewable energy, and grid resiliency
	PUC (Public Utilities Commission)	A government regulatory body that oversees utilities to ensure safe, reliable service and fair rates; In Hawaiʻi, PUC oversees Hawaiʻi's electric, gas, water, and telecommunications utilities
	HECO (Hawaiian Electric Company)	The vertically integrated electric utility serving the island of Oʻahu, responsible for generation, transmission, and dispatch of electricity
	IPP (Independent Power Producer)	A non-utility company that develops, owns, and operates power generation assets and sells electricity under contract or into the market, without owning transmission or distribution networks
Regulatory terms	**IGP (Integrated Grid Planning)**	A long-term planning document outlining how a utility will develop generation, transmission, and resources to meet future demand reliably and cost-effectively
	SPA (Strategic Partnering Agreement)	The SPA is an agreement between JERA and the State of Hawaiʻi to support Hawaiʻi's decarbonization goals and energy transition