

Jericho Energy Ventures – The Best of Both Worlds: O&G and Clean Hydrogen

Rating
BUY

Initiating

Target Price
C\$0.40

Initiating

June 15, 2023

All figures in USD unless otherwise stated

Jericho Energy Ventures Inc.	JEV:TSXV
Rating	BUY
Target Price	C\$0.40
Return to Target	67%

Market Data

Share Price	C\$0.24
Average Daily Volume (K)	16.6
FD ITM Shares (M)	243.2
Market Cap (\$M)	\$43.8
Cash (\$M)	\$1.4
Debt (\$M)	\$3.3
Enterprise Value (\$M)	\$45.6

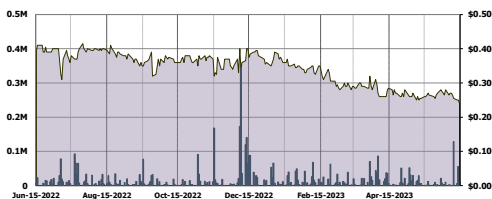
Financial Estimates

	2023E	2024E	2025E
Sales (\$M)	\$0.1	\$3.1	\$10.4
Gross Profit (\$M)	\$0.0	\$0.7	\$3.1
Adj. EBITDA (\$M)	(\$3.4)	(\$3.7)	(\$1.7)

Valuation

	2023E	2024E	2025E
EV/Sales	N/A	14.6x	4.4x
O&G Peers EV/EBITDA	4.3x	4.2x	4.5x
Hydrogen Peers EV/Sales	5.8x	3.9x	2.9x

Please refer to the applicable disclosures on the back page
Source: Atrium Research, CapitalIQ, Company Documents



Jericho Energy Ventures is an energy company positioned for the current energy transitions; owning, operating and developing both traditional hydrocarbon JV assets and advancing the low-carbon energy transition, with active investments in hydrogen.

What you need to know:

- Jericho's O&G JV assets are harvesting record cash flow and growing production steadily. The assets have a PV-10 of \$43.7M.
- JEV's wholly owned Hydrogen Technologies has an innovative solution for clean hydrogen boilers. JEV also has two minority investments in disruptive hydrogen solutions.
- JEV's management team is made up of seasoned energy professionals and its cap table contains various strategic shareholders.

Jericho Energy Ventures Inc. (JEV:TSXV, OTC:JROOF) is a publicly traded investment vehicle positioned for the energy transition by owning and operating both cash-flowing hydrocarbon JV assets and innovative hydrogen applications. The future of the Company lies with its patented Hydrogen Technologies, which has developed a zero-emission boiler technology for the industrial heat and steam industry. JEV also owns minority investments in technologies that solve critical issues in the hydrogen value chain. **We are initiating coverage on Jericho Energy Ventures with a BUY rating and target price of C\$0.40/share.**

Investment Thesis Summary

Harvesting Record Cash Flow from O&G JVs. Jericho has various joint-venture assets in E&P properties in Oklahoma, covering 52,000 acres in mid-continent legacy basins. Over the last twelve months, JEV's assets have averaged 305 BOPD and 1,959 MCFD across its 61 active wells which is expected to grow further in 2023. JEV's latest reserve report valued its assets at a PV-10 of \$43.7 (pretax), accounting for over 80% of its enterprise value. This business allows JEV to generate non-dilutive cash flow which can be re-invested in the high multiple hydrogen industry.

Hydrogen Technologies has Disruptive Potential. Hydrogen Technologies (100% owned by JEV) has developed a cutting-edge zero-emission hydrogen steam boiler system which is positioned to disrupt one of the largest carbon-emitting industries in the world, steam boilers. The patented technology is currently going through engineering studies with 34 customers, and we expect this to result in firm contacts over the next year.

Minority Investments Provide Optionality. Jericho owns 6.5% of H2U Technologies, a company that uses proprietary methods to discover and test low-cost electrocatalysts, allowing for the replacement of expensive platinum group metals. JEV also owns 10.3% of Supercritical, which is developing the world's first high-pressure ultra-efficient electrolyser that does not require a hydrogen compressor. These investments have massive upside potential in the likely event of a sale in the medium/long-term.

Management & Strategic Shareholders. JEV is led by CEO Brian Williamson who brings over 25 years of experience in the energy industry alongside an experienced team of hydrocarbon and renewable energy professionals. JEV also has various key strategic shareholders that we would not expect for a company of its size.

Sum-of-the-Parts Valuation. We value Jericho based on 0.7x the PV-10 value of its O&G JV assets, 4.0x 2025E sales from Hydrogen Technologies, in addition to its minority investments at cost, resulting in our C\$0.40/share target price.

Catalysts

- O&G Production Growth – FY23
- Hydrogen Technologies Boiler Contracts – Ongoing
- Government Funding – Ongoing

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Investment Thesis

We are initiating coverage on Jericho Energy Ventures with a BUY rating and a target price of C\$0.40/share. Jericho is a publicly traded vehicle that invests in the energy transition. The Company uses an “all of the above” investment strategy, having exposure to the entire energy transition including cash-flowing oil & gas assets, owned & operated hydrogen applications, and minority investments in disruptive early-stage low-carbon ventures. Each of the portfolio companies addresses a critical pain point in the hydrogen industry, while holistically betting on hydrogen’s ability to decarbonize commercial and industrial markets.

Harvesting Record Cash Flow from O&G JVs

Jericho has various joint-venture assets in E&P oil and gas properties in Oklahoma, covering 52,000 acres in The Stack Play and Mid-Continent legacy basins. JEV entered the region over the last eight years via acquisitions and now has a proven and probable reserve of 1,930 Mbbbls of oil, 2,557 MMcf of natural gas, and 327 Mbbbls of NGLs. Its last reserve report valued Jericho’s share of the JVs at a PV-10 of \$43.7M (pretax), accounting for over 80% of its enterprise value.

Over the last twelve months, JEV’s assets have produced an average of 305 BOPD and 1,959 MCFD across its 61 active wells. Production is expected to grow 10%+ in 2023 based on the drilling of new wells. JEV recently drilled its first vertical well since 2018 which is now contributing 68 barrels per day. While the new focus of JEV is on green hydrogen, this segment produces sizeable cash flow (\$1M+ annually) that can be reinvested into the hydrogen segment. This allows JEV to produce cash flow in a low multiple industry (O&G) and redeploy it in a high multiple industry (hydrogen), providing a strong multiple arbitrage for investors.

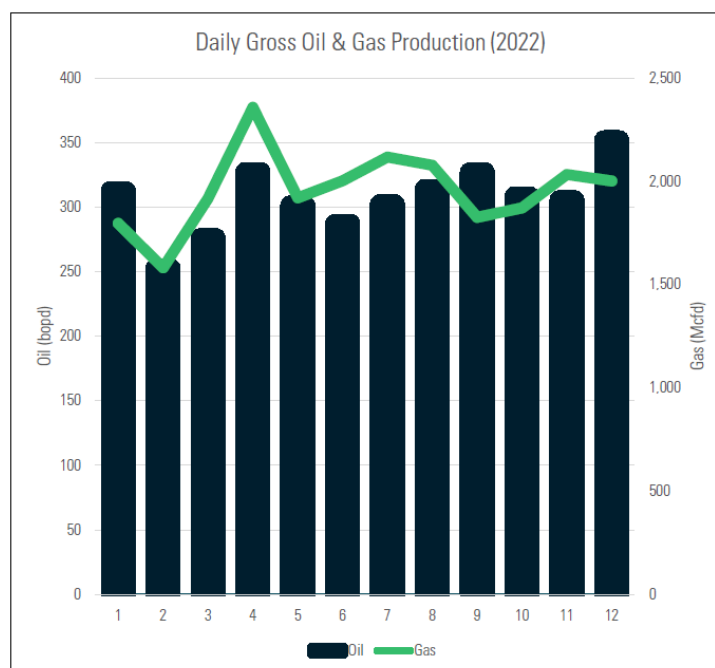


Figure 1: JEV 2022 O&G Production (Source: Company Documents)

Hydrogen Technologies Has Disruptive Potential

Hydrogen Technologies (HT) is a 100% owned and patented breakthrough zero-emission boiler technology for the heat and steam industry. The conventional commercial, industrial, and power (CI&P) boilers that fire coal, natural gas, diesel, or oil (fossil fuels) to create steam, are one of the largest single contributors of carbon in the world. According to McKinsey & Company’s May 2023 [study](#), global investment in hydrogen has surpassed 1,000 projects representing \$320B in investment through 2030 (previously estimated to be \$240B). The ever-accelerating energy transition as well as government incentives and carbon taxes bring large tailwinds to HT’s business model.

HT's cleanH2steam Dynamic Combustion Chamber™ (DCC™) Boiler harnesses the power of hydrogen, the most abundant element in the universe with the only by-product being water. It has applications in all industries that utilize high-quality steam, such as food and beverage, chemical and petrochemical, textiles, pulp and paper, and metals and mining. This results in an extremely large total addressable market for HT's boilers of over \$30B. The Company has currently engaged with over 30 customers in initial engineering processes and is expecting to announce further developments with these customers in the near-term. JEV is strategically targeting customers that use many (10-100) boilers within their business due to the possibility of repeat sales.

Within our model, we are forecasting that HT begins sales in Q4/23 while using a five-year leasing structure for its boilers. The payment structure for the boilers is still being developed but we are estimating that the units can be sold upfront for \$1.0-1.5M. We anticipate unit sales will scale quickly over the next three years to 40 cumulative units collecting lease payments in 2025, resulting in \$10M in annual sales. Through our forecast period, the business is expected to remain unprofitable however we conservatively project gross margins to scale to 50%. Beyond 2025, the various tailwinds behind the DCC boiler, as well as customer adoption (repeat sales), can lead to a long runway for future growth.

Minority Investments Provide Optionality

JEV has two minority investments, H2U Technologies and Supercritical, which both solve a critical issue in the hydrogen value chain and have massive upside potential. H2U uses proprietary methods (including AI) to discover and test low-cost electrocatalysts, used to start or speed up the electrolysis of water into hydrogen and oxygen, allowing for the replacement of expensive platinum group metals. The technology is based on 10 years of research and development and \$122M in funding from the U.S. Department of Energy through Caltech's Joint Centre for Artificial Photosynthesis. The Company is also developing a low-cost electrolyser using its patented low-cost earth-abundant catalysts. Jericho invested a total of \$1.5M into H2U preferred shares, equating to 6.5% pro-forma ownership.

Supercritical Solutions is developing the world's first high-pressure ultra-efficient electrolyser, in order to produce hydrogen and oxygen from water with zero emissions. By using heat and pressure, its technology exploits the benefits of supercritical water, delivering gases at over 200 bars of pressure without using hydrogen compressors. Typically, when hydrogen is produced from water using electrolyzers, users are required to purchase compressors to bring the energy to storage, transportation, and end-use; Supercritical's technology is able to do this without an expensive compressor. Jericho invested \$1.78M of a total \$3.45M raised via preferred shares, resulting in a 10.3% pro-forma interest in Supercritical in addition to holding one board seat. While the HT boiler is the current focus, these minority investments have potential to become even larger than HT.

Clean Hydrogen has Great Tailwinds

While hydrogen-related equities have been beaten down over the last two years, there still exists tremendous tailwinds for the industry. This includes net zero goals from countries around the world, carbon taxation, and various government support programs. The most relevant policy is the U.S. Inflation Reduction Act which will provide up to \$3.00/kg in tax credits for the production of green hydrogen in a project's first ten years of operation, making U.S.-produced clean hydrogen the cheapest globally. Canada and Europe have similar programs that support cost reduction and development of clean hydrogen solutions. Furthermore, some jurisdictions are outright banning the sale of new fossil-fuel-based boilers such as the U.K., California, Washington State, and Oregon.

The U.S. Department of Energy also has a funding program for constructing regional clean hydrogen hubs where it plans to award 6-10 hubs with \$1B in funding each. JEV's HT has been included within two regional plans (out of a total of 33) that have received letters of encouragement from the DOE. These various tailwinds provide significant support to the clean hydrogen industry, assisting with getting the cost per kilogram down to competitive levels.

Management & Strategic Shareholders

JEV is led by CEO Brian Williamson who brings over 25 years of experience in the energy industry, including President & COO of the Harbor Group (energy investments, trading, and risk management) and experience in managing a private equity platform for a New York-based financial institution. The management team and board are also made up of seasoned energy professionals with experience in both hydrocarbons and renewables.

JEV stock is tightly held, with its top 10 shareholders holding ~75% of the shares outstanding, including 10% ownership from management and significant ownership by strategic shareholders. This includes McKenna & Associates, the Graves Family (prominent family in the energy space in Oklahoma), Edward Breen (Chairman & CEO of DuPont, DD:NYSE, \$31B mkt cap), Belzberg & Co (investment firm led by Strauss Zelnick, CEO and Chairman of Take-Two Interactive, TTWO:NASDAQ, \$24B mkt cap), the Hegna Family, and Leo Wealth.

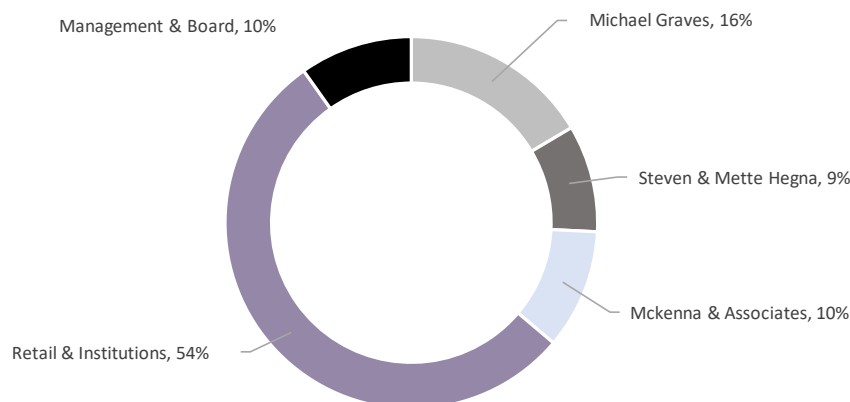


Figure 2: Ownership Breakdown

Valuation

Peer Group Analysis

We break down our peer group into two groups, E&Ps operating in the Anadarko basin and hydrogen technology providers. The E&P group trades at 4.3x 2023E EBITDA and 4.2x 2024E EBITDA. We also look to the EV/PV10 valuation, where the group averages 0.7x after adjusting the SEC pricing. The hydrogen group trades at 5.8x 2023E sales and 3.9x 2024E sales, while the few profitable players in the space trade at 19.1x 2024E EBITDA. This valuation discrepancy is the strategic rationale for JEV's capital allocation strategy which we believe it will exploit effectively. We note that peers in our group are mostly larger than JEV due to a lack of sell-side coverage in the small-cap space, but we look to PHX Minerals as the best comparable for the O&G side (5.6x 2023E EBITDA) and McPhy Energy and ITM Power as the best comparables on the hydrogen side (electrolysers manufacturers trading at 2.6x 2024E sales and 5.6x 2024E sales respectively).

Anadarko Basin E&Ps

Company	Ticker	Mkt Cap	EV	TP Reserves PV-10	EV/PV-10	EV/EBITDA		
						2022A	2023E	2024E
Devon Energy Corporation	DVN	\$31,501	\$37,544	\$25,051	1.5x	3.7x	4.6x	4.4x
Coterra Energy Inc.	CTRA	\$18,377	\$19,990	\$20,858	1.0x	N/A	4.8x	4.3x
Ovintiv Inc.	OVV	\$9,018	\$13,670	\$15,174	0.9x	2.7x	3.2x	3.1x
Diversified Energy Company Plc	DEC	\$1,141	\$2,596	\$6,100	0.4x	N/A	4.7x	5.6x
Ring Energy Inc.	REI	\$351	\$775	\$1,818	0.4x	3.4x	3.2x	3.0x
Amplify Energy Corp	AMPY	\$264	\$384	\$1,070	0.4x	3.0x	4.4x	N/A
Sandridge Energy, Inc.	SD	\$511	\$225	\$705	0.3x	1.2x	N/A	N/A
Kolibri Global Energy Inc.	KEI	\$141	\$156	\$463	0.3x	6.2x	2.7x	N/A
PHX Minerals Inc.	PHX	\$111	\$144	\$146	1.0x	5.0x	5.6x	4.9x
U.S. Energy Corp.	USEG	\$37	\$47	\$115	0.4x	6.4x	5.1x	4.3x
Average					0.7x	3.9x	4.3x	4.2x

Figure 3: Anadarko Basin E&P Peers (Source: CapitalIQ)

Hydrogen Technologies

Company	Ticker	Mkt Cap	EV	Sales CAGR (2022-2024E)	EV/Sales			EV/EBITDA		
					2022A	2023E	2024E	2022A	2023E	2024E
Linde Public Limited Company	LIN	\$183,282	\$198,463	4%	5.9x	5.8x	5.5x	19.6x	16.6x	15.8x
Plug Power Inc.	PLUG	\$6,347	\$5,625	68%	8.0x	4.3x	2.8x	N/A	N/A	35.2x
Bloom Energy Corporation	BE	\$3,514	\$4,555	26%	3.8x	3.1x	2.4x	N/A	N/A	22.0x
Nel ASA	NEL	\$2,120	\$1,714	63%	N/A	N/A	7.6x	N/A	N/A	N/A
Ballard Power Systems Inc.	BLDP	\$1,397	\$547	34%	6.5x	5.8x	3.6x	N/A	N/A	N/A
Lhyfe SA	LHYFE	\$335	\$204	1034%	N/A	17.5x	7.5x	N/A	N/A	N/A
ITM Power Plc	ITM	\$599	\$211	132%	N/A	N/A	5.6x	N/A	N/A	N/A
McPhy Energy SA	MCPHY	\$286	\$146	80%	8.4x	5.6x	2.6x	N/A	N/A	N/A
Hazer Group Limited	HZR	\$80	\$75	-19%	N/A	N/A	N/A	N/A	N/A	N/A
Sunhydrogen, Inc.	HYSR	\$91	\$40	0%	N/A	N/A	N/A	N/A	N/A	N/A
Fusion Fuel Green Public Limited	HTOO	\$33	\$33	N/A	N/A	1.2x	0.4x	N/A	N/A	3.4x
Loop Energy Inc.	LPEN	\$11	\$7	61%	3.0x	3.0x	1.2x	N/A	N/A	N/A
Next Hydrogen Solutions Inc.	NXH	\$18	\$0	151%	N/A	N/A	N/A	N/A	N/A	N/A
Average				136%	5.9x	5.8x	3.9x	19.6x	16.6x	19.1x
Jericho Energy Ventures Inc.	BES	\$44	\$46	2012%	N/A	14.6x	4.4x	N/A	N/A	N/A

Figure 4: Hydrogen Technologies Peers (Source: CapitalIQ)

Target Price Derivation

We utilize a sum-of-the-parts valuation for JEV due to the discrepancy between valuation methodologies across its assets. We lean on the 2022 reserve report's PV-10 for our valuation of the O&G JVs, applying a 0.7x EV/PV-10 multiple to achieve an enterprise value of \$30.6M or \$0.13/share. As for Hydrogen Technologies, we apply a 4.0x multiple to our 2025E sales estimate (\$10.4M) to reflect a fully built-out revenue model, obtaining an EV of \$41.6M or \$0.17/share. We then value the minority investments at cost due to their lack of visibility and predictability, resulting in \$5.0M in equity value or \$0.02/share. Adjusting for JEV's cash and debt balances, we arrive at a target price of C\$0.40/share, representing 67% upside.

SOTP Valuation	
O&G Assets	
Total Proven PV-10	\$43.7
EV/PV-10	0.7x
Enterprise Value (\$M)	\$30.6
Hydrogen Technologies	
2025E Sales (\$M)	\$10.4
EV/Sales Multiple	4.0x
Enterprise Value (\$M)	\$41.6
Minority Investments	
Equity Value (\$M)	\$5.0
(+) Cash (\$M)	\$1.4
(-) Debt (\$M)	\$3.3
Equity Value (\$M)	\$75.3
Target Price (Rounded)	C\$0.40
Upside	67%

Figure 5: Target Price Derivation

		O&G Assets P/NPV				
		0.5x	0.6x	0.7x	0.8x	0.9x
HT EV/Sales	3.0x	C\$0.30	C\$0.30	C\$0.40	C\$0.40	C\$0.40
	3.5x	C\$0.30	C\$0.40	C\$0.40	C\$0.40	C\$0.40
	4.0x	C\$0.40	C\$0.40	C\$0.40	C\$0.40	C\$0.50
	4.5x	C\$0.40	C\$0.40	C\$0.40	C\$0.50	C\$0.50
	5.0x	C\$0.40	C\$0.40	C\$0.50	C\$0.50	C\$0.50

Figure 6: Sensitivity Analysis
(See appendix for additional sensitivity analyses)

Tear Sheet

Market Data						Capital Structure						
Ticker	JEV:TSXV					Basic Shares Outstanding (M)		234.9				
Stock Price	C\$0.24					Warrants (M)		30.0				
Rating	BUY					Options (M)		19.8				
Target Price	C\$0.40					FD Shares (M)		284.7				
Upside	67%					FD ITM Shares (M)		243.2				
Market Cap (\$M)						Ownership						
Cash (\$M)						Management & Board		10%				
Debt (\$M)						Retail & Insitutions		90%				
EV (\$M)												
Financial Estimates												
	FY22A	Q1/23A	Q2/23E	Q3/23E	Q4/23E	FY23E	Q1/24E	Q2/24E	Q3/24E	Q4/24E	FY24E	FY25E
Revenue (\$M)	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.6	0.9	1.3	3.1	10.4
COGS (\$M)	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.5	0.7	0.9	2.4	7.3
Gross Profit (\$M)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.7	3.1
Gross Margin	100%	100%	100%	100%	5%	9%	10%	15%	25%	30%	24%	30%
Income from JV	2.9	(0.1)	(0.1)	(0.1)	(0.1)	(0.4)	(0.0)	(0.0)	0.0	(0.1)	(0.1)	(0.2)
Adj. EBITDA from JV	1.6	0.2	0.2	0.3	0.3	1.1	0.3	0.3	0.4	0.3	1.3	1.2
Adj. EBITDA (\$M)	(2.3)	(0.6)	(0.9)	(0.9)	(0.9)	(3.4)	(0.9)	(1.0)	(0.9)	(0.9)	(3.7)	(1.7)
Adj. EBITDA Margin	N/A	N/A	N/A	N/A	N/A	N/A	-294%	-160%	-93%	-75%	-120%	-16%
Net Income (\$M)	(4.5)	(1.3)	(1.6)	(1.6)	(1.6)	(6.1)	(1.6)	(1.7)	(1.5)	(1.6)	(6.4)	(4.3)
EPS (Basic)	(0.02)	0.01	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)

Figure 7: Tear Sheet

Jericho Energy Ventures: Company Overview

Jericho is a publicly traded vehicle that invests in the energy transition. The Company uses an “all of the above” investment strategy, having exposure to the entire transition including cash-flowing oil & gas assets, owned & operated hydrogen technologies, and minority stake investments in disruptive early-stage low carbon ventures. Its oil & gas assets are self-sufficient and unhedged, allowing for leverage to rising oil prices as the transition occurs due to the lack of exploration investment globally combined with the continued demand for hydrocarbons. JEV’s strategy focuses on molecules required for both today (hydrocarbons) and tomorrow (low carbon forms of energy), working on both challenges in the energy transition. The oil & gas assets produce cash flow in a low multiple sector (~4x EBITDA) which are re-invested into the high multiple hydrogen sector (~3x sales), allowing for multiple arbitrage. Each portfolio company addresses a critical pain point in the hydrogen industry, while holistically betting on hydrogen’s ability to decarbonize commercial and industrial markets. A summary of JEV’s corporate history can be found in Figure 9.

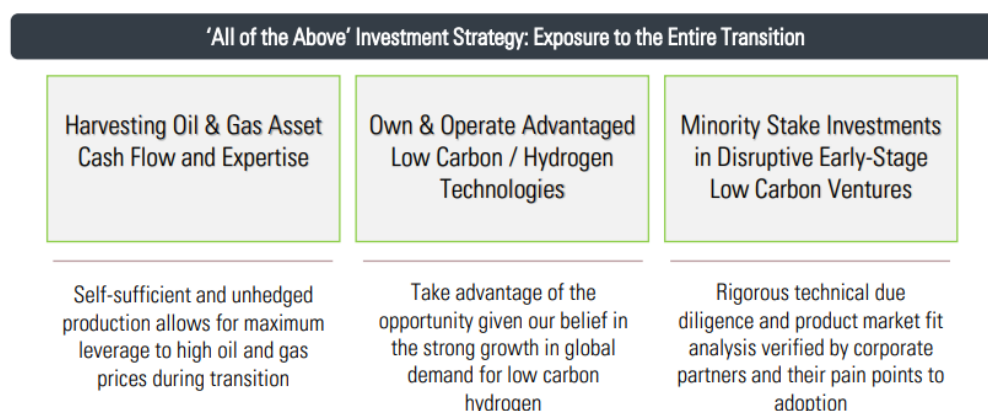


Figure 8: JEV Investment Strategy (Source: Company Documents)

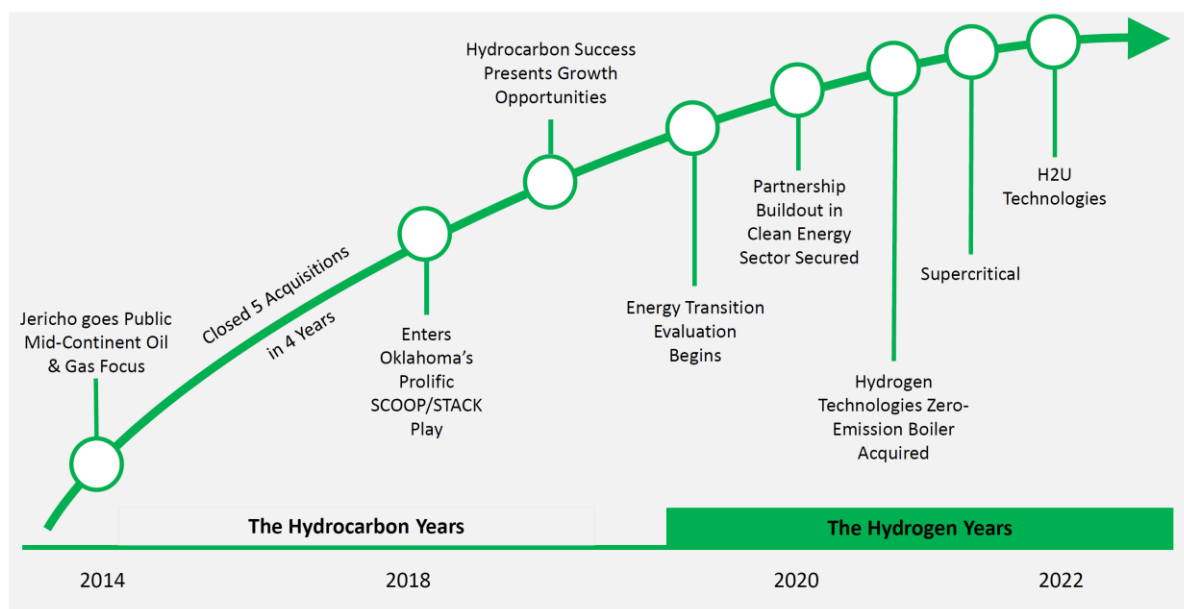


Figure 9: JEV History (Source: Company Documents)

Jericho has privileged early access to seed stage, series A, and growth equity investment opportunities with high impact and upside (5-10x potential returns). JEV's technical experts can identify and understand the new technology and trends, and assist its portfolio companies with developing plans and financing structures. JEV does this through its highly experienced Hydrogen Technologies team as well as contracted engineers. JEV also aids its portfolio companies with developing strategic and corporate partners (i.e., SoCalGas partnership).

Investment Criteria

- Disruptive Technology – pre-revenue or early-revenue growth companies with game-changing H2 technology (\$1/kg reduction or enabler)
- Large and growing global opportunity – solutions that prioritize the surge in interest from corporate clients
- Market Ready – rigorous technical due diligence and product market fit analysis verified by corporate partners and their pain-points

Jericho's strategy implementation and current investments can be found below:

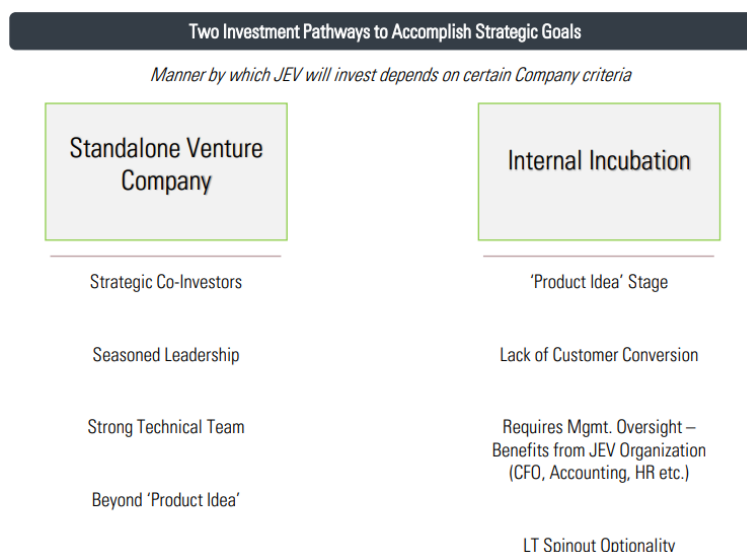


Figure 10: Investment Pathways (Source: Company Documents)

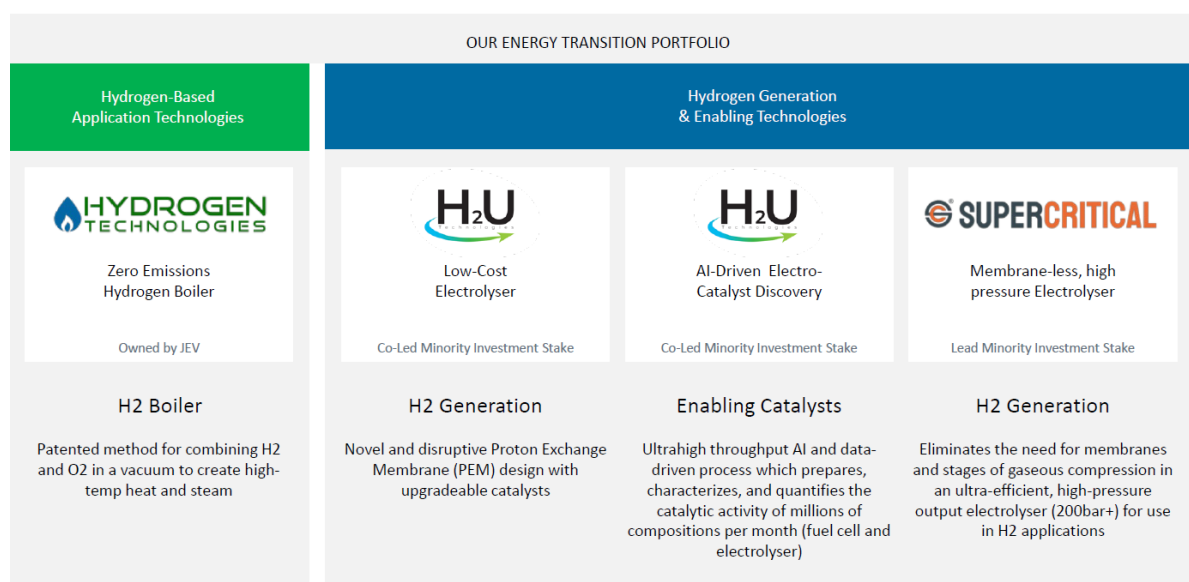


Figure 11: Current Hydrogen Investments (Source: Company Documents)



Figure 12: Areas of Operation (Source: Company Documents)

Why Hydrogen?

Hydrogen is the most abundant and simple element in the universe (found in compound forms such as water and methane), being both colourless and odourless. Hydrogen occurs as a gas under ambient pressure and temperature but becomes liquid at low temperatures. Given that it can be used for clean burning zero-emission fuel for storing and releasing energy, it has potential to have a major role in global decarbonization. Feedstock is always available and contains >2.5x the energy content per unit of mass compared to gasoline and >2.0x compared to natural gas.

Clean hydrogen is a large and growing market, with various tailwinds including net zero goals, carbon taxation, new government policies, and government financial support. Transparency Market Research estimates that the global green hydrogen market will grow from \$2.1B in 2021 to \$135.7B by 2031, representing a 52% CAGR ([Source](#)). Goldman Sachs and Bank of America estimate that 45% of energy-related GHG emissions can be decarbonized by hydrogen, representing 18-24% of total energy demand. This would imply a \$2.5 trillion TAM by 2050.

Jericho's Strategy

Jericho is embracing today's heightened demand for an energy transition by pursuing early and active positions in hydrogen, energy storage, carbon capture systems, and other new energy technologies. Jericho wants to own the entire hydrogen supply chain through its many ventures which ultimately will result in efficiencies and cost reductions across the ecosystem. Figure 15 provides a simplified example of how this can be achieved.

The Current Problem

The problem with the majority of green energy like solar and wind is that it is difficult to predict when the energy generation will take place (cloudy/sunny, windy/not windy). Additionally, the majority of solar or wind energy generation takes place midday which is typically off-peak hours for power usage as demand is low. Due to this, ~80% of the energy generated from wind goes unused because of the lack of predictability and scalable energy storage solutions. Furthermore, with the slow adoption of wind and solar, additional innovative solutions are needed to reach decarbonization goals. This is all occurring during a time when energy security and grid stability are at the forefront of political and economic concerns.

The Solution

The wasted energy (low pricing due to being able to draw from otherwise wasted energy) can be used to power electrolyzers when cheap power is available. Electrolyzers are systems that use energy and water as an input to create pure hydrogen. In this case, the electrolyzers create what is called green hydrogen because the hydrogen was created from the use of green energy (solar, wind, etc.). Green hydrogen is also created in a very inexpensive fashion because the energy was sourced during off-peak hours. The hydrogen can then be stored in the same fashion as oil & gas. This is an important step to highlight as currently there is no green high-density energy storage solution as the only alternative are batteries which have yet to prove scalability to an industrial level. Additionally, the supply issues in battery metals would elevate costs and get exasperated if industrial-scale batteries were commercialized. We encourage readers to take a look at the U.S. National Clean Hydrogen Strategy and Roadmap using this [link](#), which presents hydrogen as a solution to energy security, decarbonization, and grid stability as well.

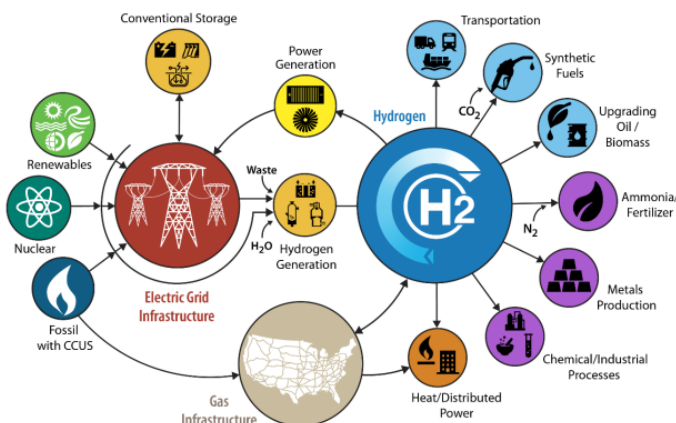


Figure 13: H2 Enables Deep Decarbonization (Source: U.S. DOE)

The final step in the solution is utilizing the green hydrogen, similar to that of oil and gas, through the use of JEV's Hydrogen Technologies boiler system. HT's boiler can be applied in the majority of industrial applications but also for electricity generation as depicted in Figure 15 where the boiler's steam turns a steam turbine to power communities. While HT is the current focus of JEV as it can provide an industrial and commercial customer base to partner with, its other investments (such as electrolyzers) provide opportunity to own the whole H₂ value chain.

This full hydrogen power solution creates the opportunity to time shift renewable energy which currently is one of the biggest issues with renewable energy. The U.S. DOE outlines further applications for hydrogen including industrial feedstock, transportation, power generation & energy storage, and buildings and hydrogen blending (Figure 14). With the JEV solution, renewables go from only being available for a few select hours in a day, to being available all day in the form of green hydrogen. Essentially, green hydrogen is similar to a battery except it is much more scalable and far cheaper.

	Industrial feedstocks	Transportation	Power generation & energy storage	Buildings and hydrogen blending
Existing demands at limited current scales	<ul style="list-style-type: none"> Oil refining Ammonia Methanol Other (e.g. food, chemicals) 	<ul style="list-style-type: none"> Forklifts and other material-handling equipment Buses Light-duty vehicles 	<ul style="list-style-type: none"> Distributed generation: primary and backup power Renewable grid integration with storage and other ancillary services 	<ul style="list-style-type: none"> Low percentage hydrogen blending in limited regions
Emerging demands and potential new opportunities	<ul style="list-style-type: none"> Steel and cement manufacturing Industrial heat Bio/synthetic fuels using hydrogen 	<ul style="list-style-type: none"> Medium- and heavy-duty vehicles Rail Maritime Aviation Offroad equipment (mining, construction, agriculture) 	<ul style="list-style-type: none"> Long-duration energy storage Hydrogen low NOx combustion Direct/reversible fuel cells Nuclear/hydrogen hybrids Fossil/waste/biomass hydrogen hybrids with CCUS 	<ul style="list-style-type: none"> Mid to high percentage hydrogen blending in certain regions with limited alternatives Building or district heating, including fuel cells and combined heat and power, for hard to electrify or limited options

Figure 14: Clean Hydrogen Opportunities (Source: U.S. DOE)

HYDROGEN VALUE CHAIN

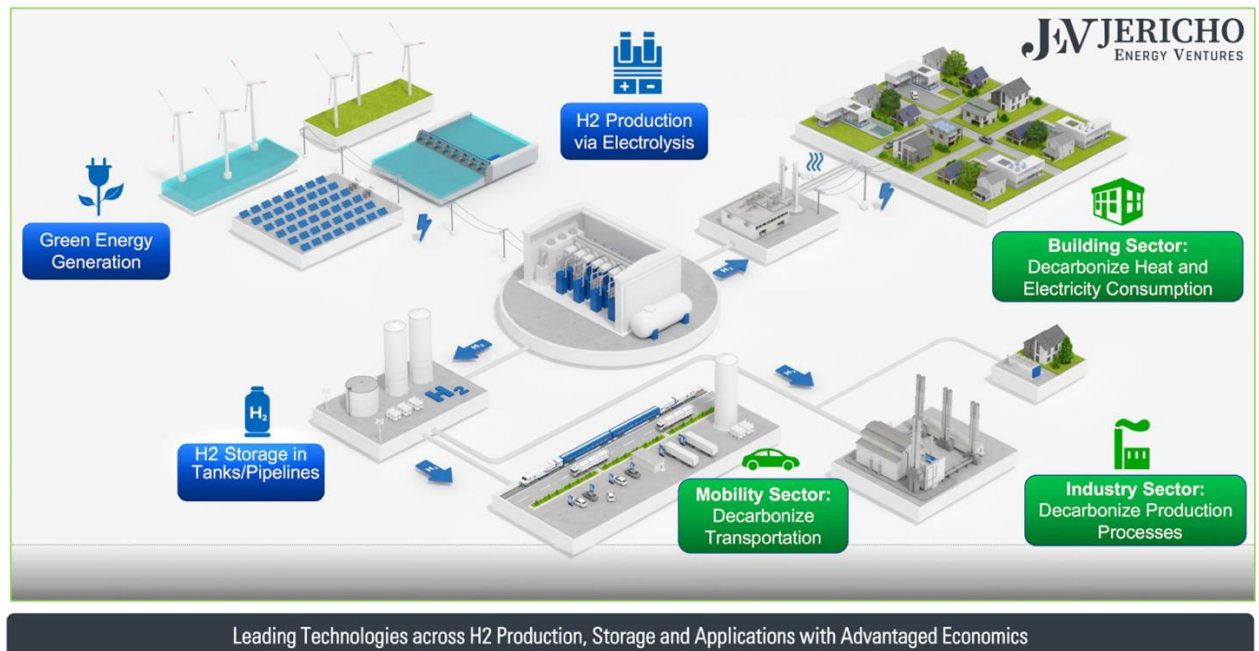


Figure 15: Full Hydrogen Value Chain Highlighting JEV's Strategic Positioning (Source: Company Documents)

Oil & Gas Assets: Company Overview

Asset Summary

Jericho has a group of JV assets in Oklahoma including Eagle Road Oil, Lurgan Oil, Jericho Buckmanville Oil, RSTACK Walnut, and Cherry Rancher (as seen in Figure 16). Its footprint spans across 52,000 acres in mid-continent legacy basins and contains strong infrastructure and equipment. This includes the Anadarko Basin STACK play, Hunton, Mississippi Lime, and Woodford Shale formations. Please see the industry overview section for a breakdown of each play. JEV entered the region over the last eight years by completing five acquisitions, taking advantage of a point in time when the region was quite overleveraged.

Company	Ownership
Eagle Road Oil	50.0%
Lurgan Oil	50.0%
Jericho Buckmanville	50.0%
RSTACK Walnut	26.5%
Cherry Rancher	31.0%

Figure 16: JEV Oklahoma Assets Ownership

Jericho's focus has been stacked-pays, meaning multiple productive oil and gas formations on the same piece of land. The STACK is a prolific system with high oil and gas content, extensive production history, and high drilling success. The region was originally developed by Exxon and Texaco but was rediscovered in 2011 using horizontal development and hydraulic fracturing. The region hosts some of the largest E&Ps including Continental Resources, Devon Energy (\$37B mkt cap), Marathon Oil (\$14B mkt cap), Ovintiv (\$13B mkt cap), and Chesapeake Energy (\$13B mkt cap).

Reserve Data

As per its December 2022 reserve report, JEV has a proven and probable reserve of 1,930 Mbbbls of light and medium oil, 2,557 MMcf of natural gas, and 327 Mbbbls of natural gas liquids. Both the light and medium oil content and natural gas content increased 9% YoY based on successful drilling.

The reserve report valued Jericho's share of the total proven assets at \$43.7M assuming a 10% discount rate, growing 37% YoY. This figure assumes \$80/bbl WTI and \$4/MMBtu natural gas prices.

Reserve Category	Light & Medium Oil		Natural Gas		Natural Gas Liquids	
	WI (Mbbbl)	NRI Net (Mbbbl)	WI (MMcf)	NRI Net (MMcf)	WI (Mbbbl)	NRI Net (Mbbbl)
Proved Developed Producing	714.2	564.5	1,394.5	1,198.7	167.2	135.3
Proved Developed Behind-Pipe	49.5	39.9	144.2	117.2	12.0	9.7
Proved Developed Non-Producing	403.4	322.7	935.7	753.9	140.7	113.7
Proved Developed Shut-In	30.1	24.1	128.5	106.8	29.6	24.4
Proved Undeveloped	832.3	679.0	438.7	356.4	52.0	42.2
Proved Reserves Total	2,029.5	1,630.2	3,041.6	2,533.0	401.5	325.3
Probable Reserves	369.4	300.1	30.6	23.7	2.4	1.9
Total Proved & Probable	2,398.9	1,930.3	3,072.2	2,556.7	403.9	327.2

Figure 17: NI 51-101 Reserve Data

Category	Pre-Tax PV-10 (\$M)
Proved Developed Producing	\$15.8
Proved Developed Behind-Pipe	\$1.3
Proved Developed Non-Producing	\$9.3
Proved Developed Shut-In	\$0.7
Proved Undeveloped	\$16.7
Proved Total	\$43.7

Figure 18: NI 51-101 PV-10 Data

Productions & Financials

Over the last twelve months, its assets as a whole have averaged 305 BOPD and 1,959 MCFD across 61 active PDP wells. In 2022, BOE production remained steady (-1% YoY) while major growth came from the increasing crude oil and natural gas prices. Its technical report estimates that JEV's share of the assets will produce 63.6 Mbbl of oil, 136.7 MMcf of natural gas, and 17.5 Mbbl of natural gas liquids in 2023. The JV assets collectively have a cash balance of \$1.9M, total assets of \$53.7M, and a book value of \$38.0M.

Property	Light & Medium Oil		Natural Gas		Natural Gas Liquids	
	WI (Mbbl)	NRI Net (Mbbl)	WI (MMcf)	NRI Net (MMcf)	WI (Mbbl)	NRI Net (Mbbl)
Cherry Rancher	0.0	0.0	0.0	3.0	0.0	0.0
Lurgan	4.2	3.4	0.0	0.0	0.0	0.0
Morrison/Eagle Road	27.0	22.0	80.6	66.0	11.8	9.7
Jericho Buckmanville	43.9	34.3	15.5	14.6	7.4	5.8
Walnut	3.2	2.6	63.1	51.0	1.9	1.6
Total Proved	78.2	62.3	159.2	134.5	21.1	17.1
Morrison/Eagle Road	1.6	1.3	2.7	2.2	0.5	0.4
Total Probable	1.6	1.3	2.7	2.2	0.5	0.4
Total Proved & Probable	79.8	63.6	161.9	136.7	21.6	17.5

Figure 19: NI 51-101 2023 Production Estimates (JEV's Share of JV)

Our production estimates can be found in the table below. We lean on the estimates in its reserve report for production and assume \$70/bbl crude oil, \$2.60/Mcf natural gas, and \$25/bbl NGL prices. Please note that the topline and adjusted EBITDA figures represent the total JV assets, which Jericho owns 40-50% of. 2023 is expected to show solid growth as Jericho has begun drilling its first new wells in years. As such, in 2023, we are expecting 16% growth in oil production, resulting in \$8.9M in revenue and \$2.2M in adjusted EBITDA (\$1.1M of which is attributable to JEV). We saw significant growth in Q1, with oil production increasing 20% YoY and natural gas production increasing 2%.

Financial Estimates												
	FY22A	Q1/23A	Q2/23E	Q3/23E	Q4/23E	FY23E	Q1/24E	Q2/24E	Q3/24E	Q4/24E	FY24E	FY25E
O&G JVs (100%)												
Oil Production (bbls/d)	253.5	292.5	290.0	310.0	280.0	293.1	292.5	290.0	310.0	280.0	293.1	293.1
Natural Gas (MMcf/d)	634.3	621.7	680.0	660.0	620.0	645.4	621.7	680.0	660.0	620.0	645.4	645.4
NGL (bbls/d)	86.2	75.4	90.0	90.0	90.0	86.3	75.4	90.0	90.0	90.0	86.3	86.3
Crude Oil (\$/Bbl)	94.4	74.4	70.0	70.0	70.0	71.1	70.0	70.0	70.0	70.0	70.0	70.0
Natural Gas (\$/Mcf)	6.4	3.4	2.5	2.5	2.5	2.7	2.5	2.5	2.5	2.5	2.5	2.5
NGL (\$/Bbl)	40.8	25.8	25.0	25.0	25.0	25.2	25.0	25.0	25.0	25.0	25.0	25.0
Oil Revenue	8.6	2.0	1.8	2.0	1.8	7.5	1.8	1.8	2.0	1.8	7.4	7.4
Natural Gas Revenue	1.4	0.2	0.2	0.1	0.1	0.6	0.1	0.2	0.1	0.1	0.6	0.6
NGL Revenue	1.3	0.2	0.2	0.2	0.2	0.8	0.2	0.2	0.2	0.2	0.8	0.8
Revenue	11.3	2.3	2.2	2.3	2.1	8.9	2.2	2.2	2.3	2.1	8.7	8.7
Adj. EBITDA (\$M)	3.9	0.6	0.5	0.6	0.6	2.2	0.7	0.6	0.8	0.6	2.7	2.4
Adj. EBITDA Margin	35%	26%	23%	24%	27%	25%	33%	28%	34%	27%	30%	28%
Jericho's Share (\$M)	1.6	0.2	0.2	0.3	0.3	1.1	0.3	0.3	0.4	0.3	1.3	1.2

Figure 20: O&G JV Income Statement Projections

Recent Developments & Exploration

On January 26th, Jericho announced the results of the Lazarus #1 vertical well at Eagle Road, its first well drilled by Jericho's JV since 2018. The well was on-production for 135 days and averaged 68 barrels per day since initiation production on December 7th, exceeding management expectations. This well alone implies 11% production growth over 2022, and in Q1/23 JEV reported 20% in oil production growth. This development was funded from cash flow and management expects to achieve payback in 18 months based on prevailing oil and natural gas prices. Management plans to continue on its Lazarus vertical development program into 2023 and 2024, while completing Lazarus #2 in Q3 and spud two new wells in H2/23.

Jericho's production showed steady results in 2022 based on increased well workover activity and development drilling to capitalize on high commodity prices. In November 2022, it was announced that JEV's JV partner in the STACK JV has agreed to divest undeveloped acreage in the STACK oil region for total proceeds of \$1.37M and a royalty on future production.

Jurisdiction Overview

Anadarko Basin STACK Play

The STACK play is located in the Anadarko Basin area of northern Oklahoma and stands for Sooner Trend (oil field), Anadarko (basin), Canadian and Kingfisher (counties). The area is approximately 1,000 square miles. The STACK was first drilled by Newfield in 2011 with their first well announced in 2013. The name also comes from its multiple stacked intervals of producible formations, allowing operators to access multiple formations from a single drilling location. Major operators in the region include Continental Resources, Devon Energy, Ovintiv, and Marathon Oil.

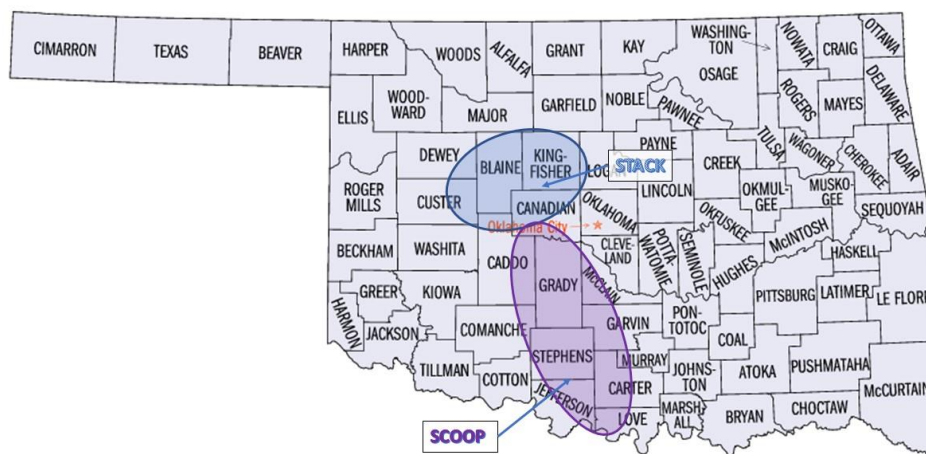


Figure 21: Anadarko Basin STACK Play (Source: Mineral Rights Podcast)

Hunton Reservoirs

The Hunton Formation is a large limestone formation extending 2.7M acres in Oklahoma, Texas, New Mexico, and Arkansas. The formation is known for large water production and as such, is a de-watering play. Hunton was originally exploited in the 1990s and now averages 100 wells drilled annually by various large operators such as Chesapeake Energy. Both horizontal and vertical wells have been used in the area.

Mississippi Lime

The Mississippi Lime has emerged as one of the top horizontal plays in the U.S., covering 17M acres in Northern Oklahoma and Southern Kansas. The formation was first drilled vertically in the 1940s then horizontally drilled starting in 2007. The play lies at fairly shallow depth (4,000-7,000 feet) and features various characteristics such as shale and tight sands. Sandridge Energy is the largest player in this formation with over 2M acres of land, with Chesapeake and Devon Energy also operating in the region.

Woodford Shale

Woodford Shale is located in southeastern Oklahoma and is the 2nd oldest gas-producing formation in the U.S., being part of the Anadarko Basin. The region is known for shallow reservoirs and being majority horizontal wells since 2007. The region has various formations such as SCOOP and STACK. Large players in the region include Devon Energy, Newfield Exploration, and Continental Resources.

Hydrogen Technologies: Company Overview

The Opportunity

Over the next few decades, many technologies and industries will shift to green energy and Hydrogen Technologies is on the forefront of that transition across various large industries. Conventional Commercial, Industrial, and Power (CI&P) boilers that fire coal, natural gas, diesel, or oil (fossil fuels) contribute to global greenhouse gases by creating and releasing CO₂ through steam. The global heating and steam markets account for a significant portion of all CO₂ emissions and is expected to grow at a 5-7% CAGR. Additionally, 37% of all fossil fuels utilized in U.S. industry today, excluding electricity, are burned to produce steam ([Source](#)). Beyond the energy transition, many businesses are preparing for the implementation of carbon taxes as they can significantly impact future profits. Furthermore, government support from countries around the world is incentivizing the use of clean hydrogen, making it more competitive on a cost basis to traditional energy sources.

Hydrogen Technologies (100% owned by JEV) has patented a breakthrough technology for burning hydrogen and oxygen in a zero/slightly negative pressure chamber in order to create high-temperature heat and steam with zero greenhouse gases emitted. The Company's cleanH2steam Dynamic Combustion Chamber™ (DCC™) Boiler harnesses the power of hydrogen combustion in oxygen to produce steam, with the only by-product being water. This technology is a zero-emission energy solution for the commercial and industrial boiler market. Though this market is not well known in the financial world, it is a massive industry, and the product serves a wide range of applications such as power generation plants, district heating, food processing, chemical refining, pulp and paper mills, and large venue halls.

How It Works

The cleanH2steam DCC was developed from scratch to be the industrial boiler of the future. The product maximizes thermal efficiency, minimizes operational headaches, and emits no greenhouse gases or other pollutants. The DCC Boiler burns essentially pure hydrogen in oxygen, to create superheated steam in the burner section. The superheated steam then enters the heat exchange section transferring its energy to the shell side process water. Since the system does not use atmospheric air and carbon combustion, the system is free of CO₂, N₂, CO, SO_x, NO_x, etc., and thus needs no flue stack (smokestack) or any other energy-dissipating exhaust. Moreover, the combusted water is condensed and either recovered to reuse or sent to a drain. It is fundamentally a steam-condensing boiler. All the vessels and piping in the DCC are insulated to provide a thermal efficiency of >95%.

This scalable process is based on combining hydrogen and oxygen to form water molecules. The reaction releases 61,000 British Thermal Units (BTUs) per pound of hydrogen. It is this energy that is used to heat water and generate steam. The heat is extracted across typical stainless-steel heat exchangers commonly used in industrial applications. The HT condensing process revolutionizes boiler applications in the following ways:

1. Emits no carbon-based or NO_x particles when burning pure hydrogen
2. Uses pure oxygen rather than atmospheric air for combustion, eliminating NO_x, other GHG formations, and subsequent emissions.
3. Delivers a boiler thermal efficiency of >95%
4. Operates quietly compared to traditional boilers.

On September 22, JEV announced that the DCC Boiler has been validated as operating with an overall GHG-free fuel combustion efficiency of nearly 100% in recent independent testing by Process Engineering Associates. This data suggested that the burners are combusting the vast majority (or all) of the hydrogen gas being supplied to the boiler. Based on these performance results, little to no fuel is left unburned representing efficient combustion in the unit.

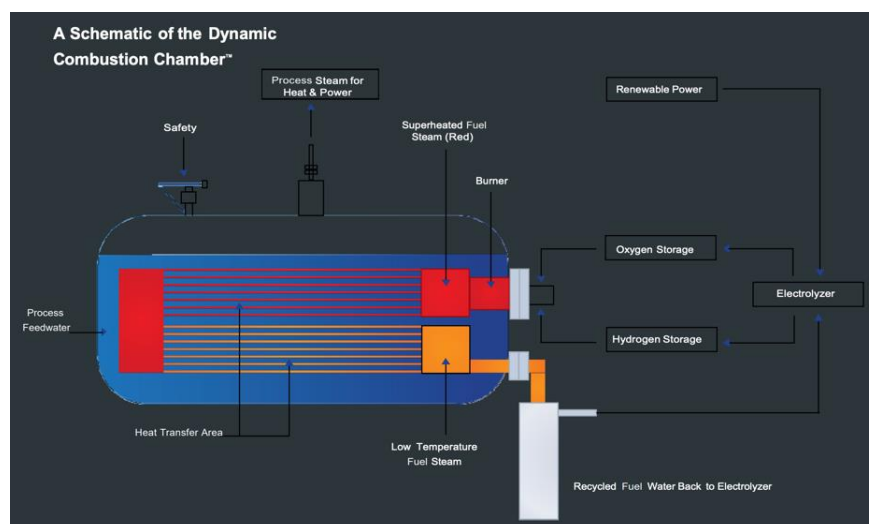


Figure 22: DCC Schematic (Source: Company Documents)

Safety

HT is dedicated to designing and operating safe equipment. The Company uses well-known technology and equipment and state-of-the-art monitoring and operating software. Additionally, HT has developed a Safety Management Plan and Risk Management Plan for the boiler process.

Products

HT has designed three standard-sized boilers around the most demanded output requirements for heat and process steam applications. The system does have a series of customizable features and offers “turn up and turn down to achieve output” between the ranges. The three sizes are related to output per hour, or kilograms of steam per hour (DCC 3000, DCC 6000, and DCC 30K) as seen below. For instance, the DCC 6000 produces 6,000 kg of steam per hour, the equivalent of 500 horsepower, 21.2MMbtu, or 13,200 lbs of steam, capable of driving a highly efficient 1Mwe steam turbine. For larger steam power applications, the DCC can be set in series or customized for larger output.

Product	Steam Production (kg/hr steam)	Max Steam Temp (° C)	Utilization Horsepower (BHP)	Designed Thermal Output (MMBtu/hr)	Steam Output (lb/hr steam)	Consumes (kg/hr Hydrogen)	Max Steam Pressure (PSIG)
DCC 3000	3,000	189	239	8	6,600	~62	165
DCC 6000	6,000	189	478	16	13,200	~123	165
DCC 30K	30,000	254	2,390	80	66,000	~620	600

Figure 23: Performance Data for DCC Products (Source: Company Documents)

Applications

HT’s boilers are designed to replace traditional fossil-fuel-based combustion boilers for some of the world’s largest heavy industries that require heat and high-quality steam. High-quality clean steam is largely consumed and utilized in CI&P (commercial, industrial, and power) applications. Commercial applications are largely focused on steam boilers for heat, hot water, and combined heat and power applications. Industrial applications are primarily focused on high-quality steam related to food and beverage, chemical and petrochemical, textiles, pulp and paper, and metals and mining industries as well as other large consumers of heat and steam. As an example, steam and hot water place an integral role in food and beverage processing including sterilization, disinfecting, pasteurization, reducing microbiological bacteria, cooking, curing, and drying.

For the power and utility space, the HT boiler is a ready-made fit for building and district energy systems. In relation to power generation and the ability for hydrogen to be a store of energy (similar to oil, natural gas, etc.), as mentioned above, the DCC system allows customers to take advantage of favourable power pricing during off-peak hours or when renewable power sources generate excess power supply to produce the hydrogen and oxygen input fuel and then ultimately be converted to energy when needed (on-demand power). The ability to provide on-demand power is a massive benefit of this type of energy production versus many other green energy sources like solar, wind, and hydro which produce electricity intermittently. Furthermore, nuclear energy is produced continuously as it cannot be easily shut off, resulting in large amounts of energy being burnt off and wasted during off-peak hours.

Customers

As mentioned above, the steam boiler industry is a large industry which serves a wide range of applications. Figure 24 highlights these industries and what portion of their fossil fuel usage is attributed to steam production including, Pulp and Paper (81%), Food and Beverage (57%), Chemical/Petrochemical (42%), Oil Refineries and Production (30%), and Commercial Properties (28%). The TAM for HT's boilers is extremely large (over \$30B for commercial, industrial, and combined heating and power markets) however, the Company is currently focused on businesses that use many (10-100) boilers within their overall business. The idea behind this strategy is that by building and proving the technology for the first hydrogen boiler at each of its customers' facilities, it will lead to repeat sales from the same company as it scales its energy transition efforts. We like this strategy because the engineering and implementation of JEV's boiler systems is quite extensive and deploying multiple boilers within a single client will lead to more efficiencies, better margins, and quicker deployments. Within this strategy, JEV is targeting customers who seek to own and operate their infrastructure.

JEV has stated that it is going through initial engineering processes (optimizing the boiler to suit the customers' needs) with over 30 customers and we expect further developments with these clients to occur throughout 2023. On November 2nd, JEV reported that it is conducting feasibility studies for the DCC boiler at 34 sites across seven industries (food & beverage, auto, pharma) and five continents. Management expects the inflation reduction act (and other government support programs) to further increase the interest in the DCC boiler over the next year.

In August 2022, JEV announced an MOU with Australia-based LINE Hydrogen to bring the DCC to Australian customers. LINE is looking to have the DCC installed as part of its use case in Tasmania, Australia and supported by LINE's hydrogen plant in George Town, Tasmania.

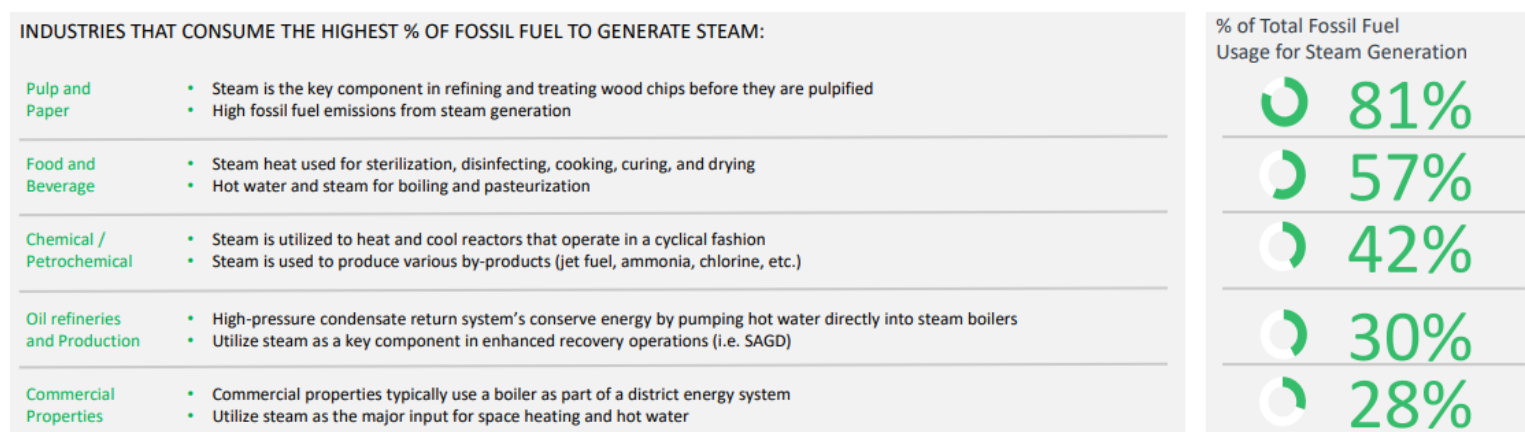


Figure 24: Industries that Consume Fossil Fuels to Generate Steam (Source: Company Documents)

Supply Chain

Jericho currently works with its customers to ensure they have all the necessary ingredients in their supply chain to ensure the HT boiler solution is effective. JEV ultimately aims to own the entire hydrogen supply chain through its minority investments and strategic partnerships in and around the hydrogen supply for the HT boilers. However, while the technologies of its minority investments are being developed, JEV will obtain hydrogen to fuel the HT boilers from external sources. Currently, Grey Hydrogen, which is hydrogen sourced through the use of fossil fuels, is fairly inexpensive and easily available via tube trailer or over-the-fence generation in most markets. Jericho has relationships with several strong Grey Hydrogen providers that have worked with them throughout HT's feasibility study processes with many of its customers. Grey Hydrogen makes up ~98% of the current market, but with the market moving to greener energy sources, Green Hydrogen, which is hydrogen created through electrolysis through the use of non-renewable or a preferred renewable power supply, is expected to grow substantially. JEV's access to Green Hydrogen will likely come from its own onsite electrolyzers. In the long-term, Jericho envisions providing a full end-to-end solution in-house for its customers including Green Hydrogen production.

From a hydrogen cost perspective, prices range considerably based on location and quantity, and whether it is sourced as green or grey hydrogen. Grey hydrogen is considerably less expensive than green, however, is still not competitive from a cost perspective when compared to natural gas. Like any industry, costs will come down as both green and grey hydrogen suppliers scale operations. Additionally, similar to the natural gas industry 30+ years ago and the solar industry over the last 15 years, governmental grants, subsidies, as well as taxes/penalties for emissions, help make this industry become more competitive.

Competition

JEV states that there are no zero-emissions hydrogen boilers besides Hydrogen Technologies DCC. However, the DCC exists in the broader context of boilers that utilize fossil fuels and non-hydrogen zero-emission technologies. Figures 25 and 26 highlight the competitive advantages around both cost and environmental efficiencies of HT's boiler, illustrating the lack of true competition.

Steam boilers outside of HT's DCC boiler pose a dual problem as these boilers not only produce harmful GHG emissions in the form of waste heat and gas, but also can be expensive and are being regulated or taxed out of use in a growing number of markets in the not-too-distant future. The traditional boilers are more expensive due to the lack of a closed loop (less efficient) system which greatly increases the amount of carbon-emitting fuel input for the same amount of useful energy output.

In addition to fossil fuel-based boilers, there exists alternative zero-emission boilers; however, these alternatives have their own challenges. Boilers such as 'Hydrogen-Ready' boilers and electric boilers currently have issues around reliability, operational and maintenance costs, total costs, and total emissions profile.

Many natural gas boilers have the capability to accept a fuel mix of <20% pure hydrogen and some large boiler manufacturers are beginning to market dual-fuel or 100% hydrogen boilers for residential and limited commercial applications. However, all of these existing boiler designs burn hydrogen in the presence of air (not a closed loop), which generates emissions that must be vented via a smokestack. The subsequent need for a smokestack results in energy losses and GHG emissions which cannot be designed around in an effective manner.

While electric boilers are capable of producing high-pressure high-temperature steam, there are a few issues with this technology which are the main reasons electric boilers have not taken up much of the boiler market: 1) Grid/regulatory acceptance of high-output transformers, 2) Fouling of internal electrical components shortens service life and reduces uptime, 3) Water purity must be upgraded to reduce fouling, and 4) Availability of peak power requirements and related peak demand charges.

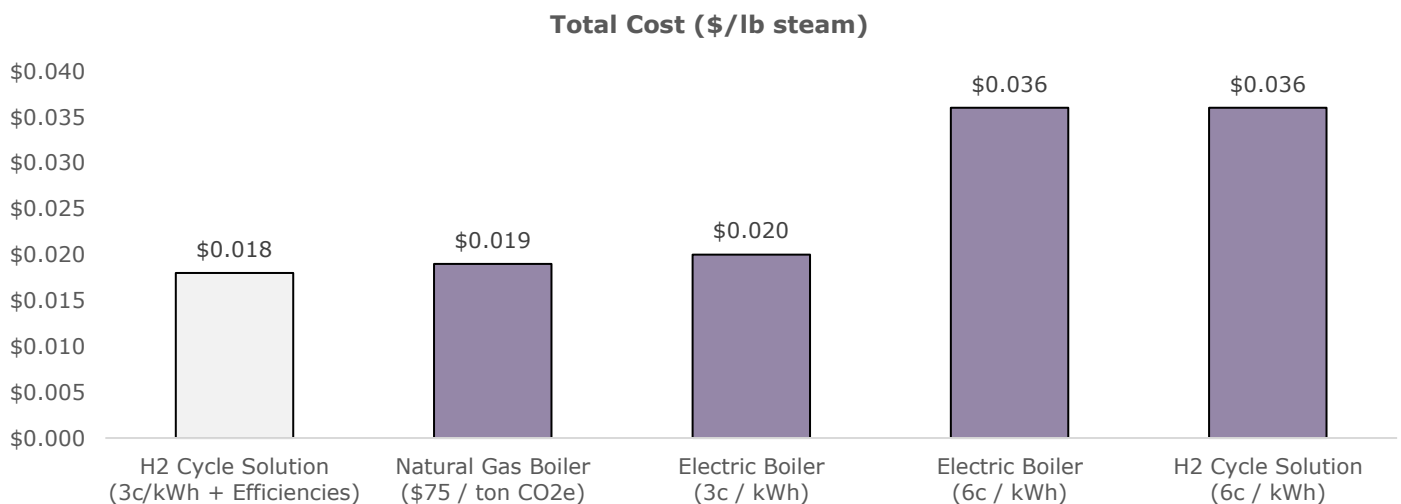


Figure 25: Boiler Cost Comparison (Source: Company Documents)

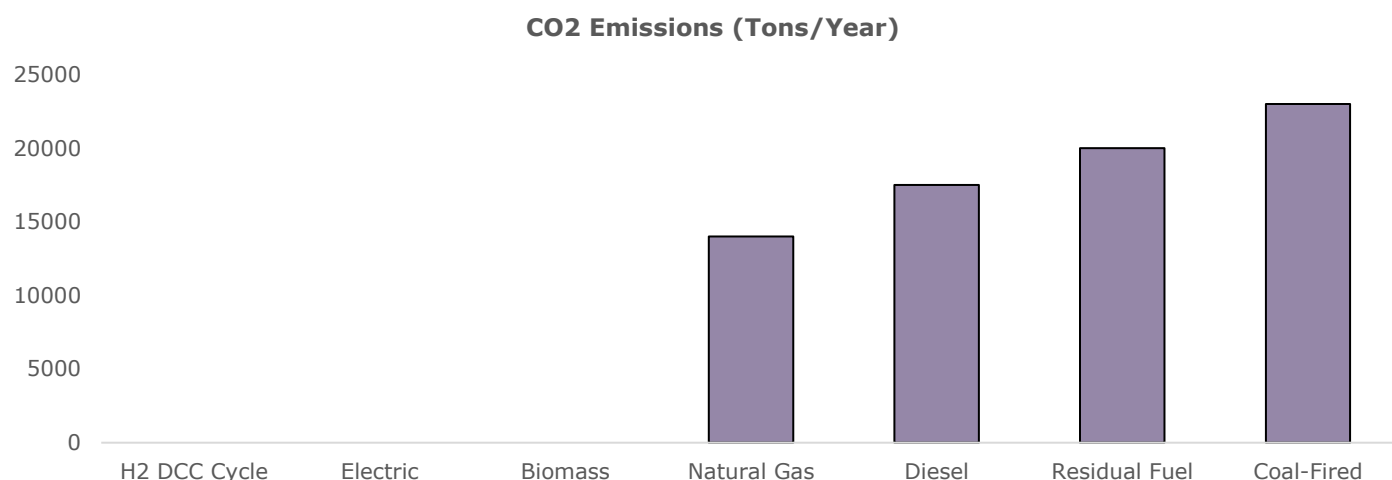


Figure 26: Boiler Emission Comparison (Source: Company Documents)

ESG Tailwinds

There are many important tailwinds supporting JEV and the hydrogen industry including net zero goals, carbon taxation, new policies, and government support. Transparency Market Research estimates that the global green hydrogen market will grow from \$2.1B in 2021 to \$135.7B by 2023, representing a 52% CAGR. Furthermore, Goldman Sachs and Bank of America estimate that 45% of energy-related GHG emissions can be decarbonized by hydrogen, representing 18-24% of total energy demand. This would imply a \$2.5 trillion TAM by 2050. A breakdown of each tailwind can be found below.

Net Zero Goals

Recent concerns regarding GHG emissions and their impact on global warming have sprung many government regulations trying to reduce harmful emissions. Through this, governments and corporations alike are pushing to achieve near-term goals (2030) and longer-term (2050) emission reduction goals. As mentioned above, because fossil fuel boilers are such a major contributor to carbon emissions, many corporations are increasingly turning to lower and zero-emission boiler systems to meet their ESG goals.

Carbon Pricing & Taxation

Carbon pricing and taxation can be a massive tailwind for JEV and the hydrogen industry. Over 64 carbon pricing initiatives have been implemented or scheduled to date and carbon pricing schemes or tax assumptions are beginning to be included in customer's economic analyses for their fossil fuel boilers systems. Carbon pricing and taxation forecasting in this industry is critical as most boilers are a 20-30 year investment so forecasting future carbon taxes is critical. Canada has already introduced a phased-in carbon tax, beginning at \$50/ton in 2022 and rising to \$133/ton by 2030 and the current cost of carbon in the EU is \$40/ton.

New Policy & Government Support

Banning of Fossil-Fuel-Based Boilers

Some countries and local jurisdictions are outright banning the sale of new fossil-fuel based-boilers, such as the United Kingdom, and West Coast States (California, Washington state, Oregon). Again, the push to ban traditional boilers should only lead customers to JEV as a zero-emission solution.

U.S. Department of Energy Funding

On January 9th, JEV announced that the Pacific Northwest Hydrogen Association (PNWH2) received a letter of encouragement from the U.S. DOE to submit a full application for funding to construct a regional clean hydrogen hub. The submission included JEV's DCC boiler in partnership with a leading district energy provider. JEV is also part of HALO Hydrogen Hub which also received a letter of encouragement. HALO Hydrogen Hub is a three-state partnership between Arkansas, Louisiana, and Oklahoma which included the DCC boiler in partnership with one of the largest food companies in the U.S. Of the 33 potential candidate papers, the DOE expects to award 6-10 of them with \$1B in funding per hub. The program also includes \$1B for a clean hydrogen electrolysis program and \$500M for clean hydrogen manufacturing and recycling initiatives.

Inflation Reduction Act

In August 2022, the U.S. government passed its Inflation Reduction Act (IRA) which included \$369B in spending towards energy security and climate change, including the Clean Hydrogen Production Tax Credit (PTC). This will provide up to \$3.00/kg in tax credits for the production of green hydrogen in a project's first ten years of operation. The tax credits are estimated to reduce the cost to produce clean hydrogen by more than 50% and should make clean hydrogen produced in the U.S. the cheapest form of clean hydrogen in the world. The bill also extended the existing investment tax credit for hydrogen projects and hydrogen storage technologies. The U.S. defines clean hydrogen as hydrogen projects producing less than 4 kg of CO₂e per Kg of Hydrogen while grey hydrogen ranges from 10-12 kg.

CO ₂ e Kg per Kg of Clean Hydrogen	Portion of Project Costs Costs Claimable	Tax Credit
2.5 - 4.0	1.2%	6% of project costs
1.5 - 2.5	1.5%	7.5% of project costs
0.45 - 1.5	2.0%	10% of project costs
0.0 - 0.45	6.0%	30% of project costs

Figure 27: IRA Clean Hydrogen Tax Credits

The IRA also included a production tax rate of 2.6 cents per kWh for all forms of renewable energy, including green hydrogen. The DOE has set a target to get green hydrogen costs down to \$2/kg by 2025 and \$1/kg by 2030. This government support makes green hydrogen more competitive with coal and natural gas from a cost perspective, assisting with barriers to adoption. We are also seeing state-specific incentives on top of the IRA.

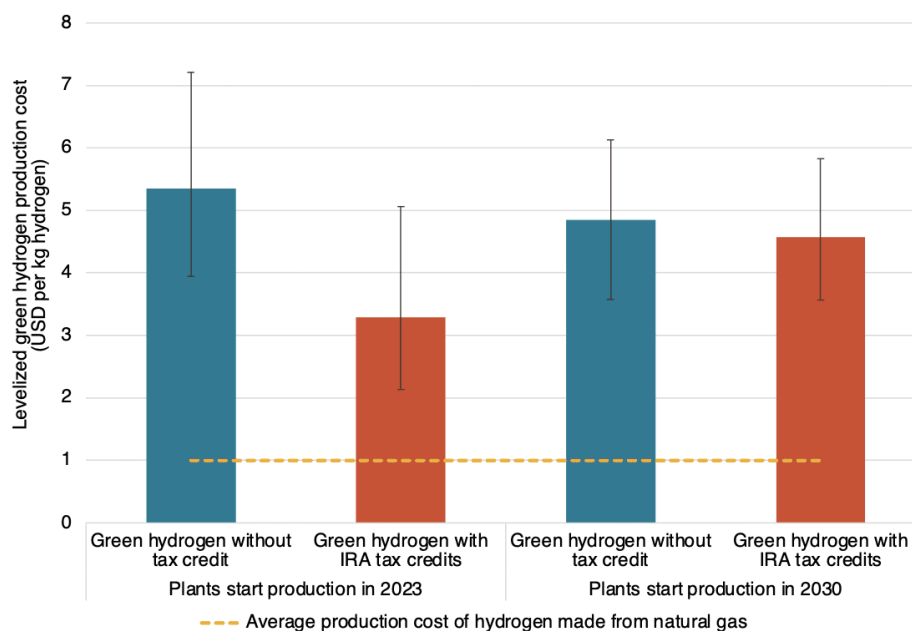


Figure 28: Effect of IRA Tax Credits (Source: ICCT)

Canada's 2023 Budget

In April, the Canadian government outlaid its 2023 budget which included a C\$5.6B clean hydrogen investment tax credit. The credit will support up to 40% of project costs, compared to the 30% proposed in the previous year. The policy is aiming to solve three major issues including bolstering clean hydrogen production to meet climate change goals, matching/beating the U.S. incentive, and creating a new source of premium energy for export.

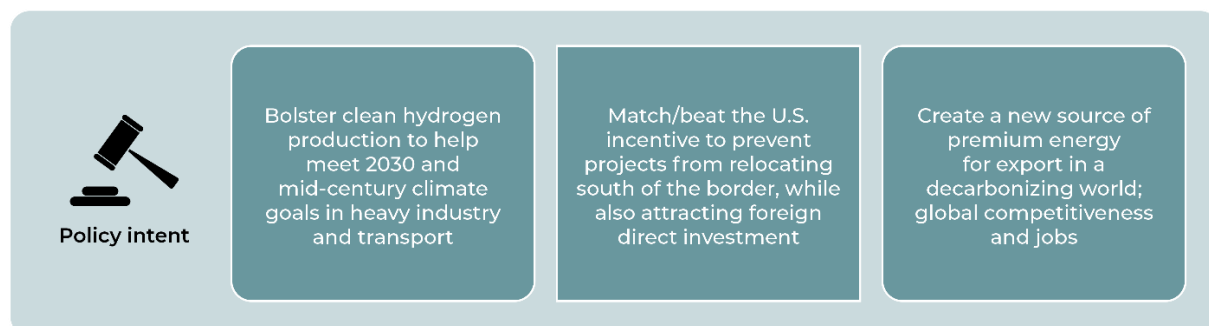


Figure 29: Canada's Hydrogen Investment Tax Credit Rationale (Source: Climate Institute)

Important Projects of Common European Interest (IPCEI)

In July 2022, the European Commission approved the first IPCEI in the field of hydrogen including 35 companies from 15 countries covering hydrogen generation, fuel cells, storage and transportation, and end-user applications. The 15 countries will each provide up to €5.4 billion in public funding in the coming years, which is expected to unlock an additional €9 billion in private investments. In September 2022, the second IPCEI for hydrogen was approved including 35 countries which will each provide up to €5.2 billion in public funding in the coming years, which is expected to unlock an additional €7 billion in private investments. The rationale for the program is to boost the supply of renewable and low-carbon hydrogen, reducing dependency on natural gas.

Financials

We are forecasting that HT begins sales in Q4/23 while using a five-year leasing structure for its boilers. We note that the payment structure is still being developed by JEV and some units can be sold upfront for \$1.0-1.5M, but do not include this in our estimates. We are estimating that unit sales scale drastically over the next three years, rising to having 40 cumulative units collecting lease payments in 2025, resulting in \$10M in annual sales. As for profitability, we are conservatively projecting that gross margins scale to 30% while the business remains unprofitable through our forecast period. However, we again note that there is high variability in these figures given the early stages of the commercialization.

Financial Estimates												
	FY22A	Q1/23A	Q2/23E	Q3/23E	Q4/23E	FY23E	Q1/24E	Q2/24E	Q3/24E	Q4/24E	FY24E	FY25E
Hydrogen Technologies												
Cumulative Units Sold	0	0	0	0	1	1	5	10	15	20	20	40
Revenue (\$M)	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.6	0.9	1.3	3.1	10.4
Gross Profit (\$M)	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.7	3.1
Gross Margin	N/A	100%	100%	100%	5%	9%	10%	15%	25%	30%	24%	30%
Adj. EBITDA (\$M)	N/A	N/A	N/A	N/A	(1.2)	(3.6)	(1.3)	(1.3)	(1.3)	(1.2)	(5.1)	(2.9)
Adj. EBITDA Margin	N/A	N/A	N/A	N/A	N/A	N/A	-406%	-209%	-135%	-98%	-162%	-28%

Figure 30: Hydrogen Technologies Income Statement Projections

Minority Investments & Partnerships

H2U Technologies

H2U uses proprietary methods to discover and test low-cost electrocatalysts, used to start or speed up the electrolysis of water into hydrogen and oxygen, allowing for the replacement of expensive platinum group metals catalysts. The technology is based on 10 years of research and development and \$122M in funding from the U.S. Department of Energy through Caltech's Joint Centre for Artificial Photosynthesis. The technology is exclusively licensed to H2U by Caltech. H2U has developed a proprietary ultra-high throughput, AI-driven electrocatalyst discovery program for electrolyser and fuel cell applications. The Company is also developing a low-cost electrolyser using its patented low-cost earth-abundant catalysts.

In March 2022, H2U completed an \$11M series A preferred shares funding round led by Jericho Ventures, Freeflow Ventures, VoLo Earth Ventures, and Hess Corporation, following its \$7M Series A financing in 2021 led by Jericho, Hess, Dolby Family Ventures, and Motus Ventures. Jericho invested a total of \$1.5M into H2U preferred shares, equating to 6.5% pro-forma ownership. The proceeds were expected to be used for the advancement of H2U's electrolyser designs and to commission the build of its proprietary Catalyst Discovery Engine (CDE). H2U operates out of a 25,000-square-foot facility in Chatsworth, CA. We note that the value creation mechanism for H2U is likely a sale, and as such we conservatively estimate its value at JEV's cost in our valuation analysis.

AI-Driven Electro-Catalyst Discovery

Given the growing demand for clean hydrogen, the demand for rare earth metals is expected to dramatically increase over the next decade. H2U's CDE can identify earth-abundant alternative catalysts one million times faster than the traditional catalyst discovery progress using artificial intelligence to identify non-platinum group metals catalysts. The CDE tests millions of combinations of treatments, identifying pixels with the most promising catalytic properties. Its initial catalyst discovery program has found cheap earth-abundant, Oxygen Evolution Reaction and Hydrogen Evolution Reaction catalysts.

In March 2022, H2U signed a joint development agreement with De Nora, the leading catalyst-coated membrane supplier to help bring H2U's earth-abundant catalysts to the electrolyser market. In March 2023, H2U announced that it has partnered with Tokyo Gas Co. under a multi-year joint development agreement to discover novel catalysts and develop techniques to apply those catalysts onto membranes. Tokyo Gas is the largest provider of city gas in Tokyo and the surrounding regions and aims to develop low-cost, high-performance, non-iridium catalysts and catalyst-coated membranes, thereby developing an insurance policy against future supply chain issues.

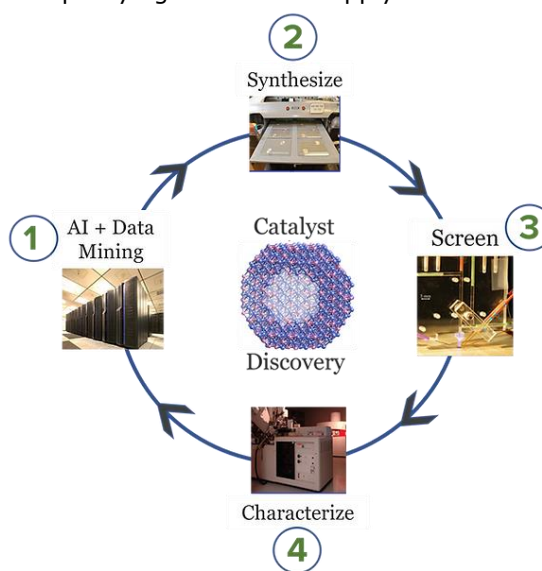


Figure 31: H2U Catalyst Discovery Process (Source: Company Documents)

Low-Cost Electrolyser

H2U plans to leverage its discovery technology to develop its own non-precious metal-based proton exchange membrane (PEM) electrolyser for commercial adoption. H2U has the world's largest electrocatalyst activity database, making this the natural transition for its business.

In 2021, H2U announced a strategic partnership with SoCalGas, the largest natural gas distributor in the United States. SoCalGas plans to replace up to 25% of its natural gas with clean hydrogen, requiring 10-20 GW of electrolysis capacity. SoCalGas plans to pilot H2U's PEM electrolyser.



Figure 32: H2U Electrolyser (Source: Company Documents)

Supercritical Solutions

Supercritical Solutions is developing the world's first high-pressure ultra-efficient electrolyser, in order to produce hydrogen and oxygen from water with zero emissions. By using heat and pressure, its technology exploits the benefits of supercritical water, delivering gases at over 200 bars of pressure without using hydrogen compressors.

Nearly all H₂ today is utilized in high-pressure applications, yet current electrolyzers output low-pressure H₂ since they cannot tolerate heat and pressure. To compress the H₂, it typically costs \$1.00-1.50/kg. Thus, when hydrogen is produced from water using electrolyzers, users are required to purchase compressors to bring the energy to storage, transportation, and end-use. Supercritical's technology exploits heat and pressure to create hydrogen without a compressor (we encourage readers to watch a video demonstration [here](#)) without using a membrane. It does this using the benefits of electrolysis of water under thermodynamic supercritical conditions (water at high temperatures and

pressures). The bonds between the hydrogen and oxygen atoms of water are weakened and require less electrical energy to split the bonds and free the hydrogen atoms. This allows Supercritical to require 20% less energy inputs to produce the same amount of hydrogen as its competitors. The system can also use waste heat to further reduce energy demand. This technology can be applied to various sectors, including energy, industrial gas, heavy industries, chemicals, food & beverage, and transportation.

We note that 55% of all H₂ today is used for ammonia, which required 200 bars of pressure, allowing for a clear go-to-market strategy for Supercritical.

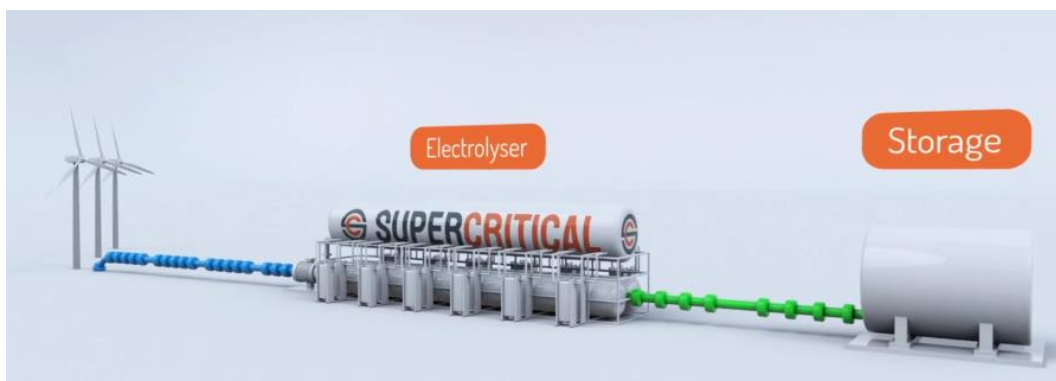


Figure 33: Supercritical Design (Source: Company Documents)

Jericho led a Seed Series financing round in January 2022 and holds a minority equity position in the Company as well as a seat on its board of directors (one of five). Jericho invested \$1.78M in preferred shares of a total \$3.45M raised, resulting in a 10.3% pro-forma interest in Supercritical. Other investors in Supercritical include Anglo American (AAL:LSE, \$36B mkt cap), Lowercarbon Capital (led by Chris Sacca), New Energy Technology, and Deep Science Ventures.

In May 2022, the Company received £146,000 in funding from the U.K.'s Department of Business, Energy, & Industrial Strategy and can receive up to £6M in Phase 2 as part of the U.K.'s Net Zero Innovation Portfolio Low Carbon Hydrogen Supply 2 Competition. Supercritical was won numerous grants and awards including OZ Minerals Experiment Hydrogen Hypothesis Finalist, Top 50 to Watch to Climate Action, Top 5 Zero Emission Solutions to Watch 2022, and Runner-Up and People's Choice in Shell's 2021 New Energy Challenge. We again note that the value creation mechanism for Supercritical is likely a sale, and as such we conservatively estimate its value as JEV's cost in our valuation analysis.

Ramp Equity Capital Partners

In June 2023, JEV announced that it has executed an MOU with Ramp Equity Capital Partners to bring the DCC Boiler to the South Korean market. Ramp Equity Capital Partners is a private equity advisory firm focused on renewable energy globally. Ramp is affiliated with one of South Korea's largest renewable energy producers that is exploring its entrance into the hydrogen market. The MOU aims for the deployment of DCC Boilers as part of this firm's hydrogen strategy. South Korea is aiming to be 100% carbon neutral by 2050 and plans to source one-third of its energy from hydrogen.

Exogen

Exogen offers end-to-end hydrogen energy solutions to help companies facilitate their roadmap to net-zero targets. The Company engages with governments and industries to empower the transition to green hydrogen. Exogen and JEV executed an MOU in October 2022 to bring to the EU a leading hydrogen boiler technology, the DCC Boiler. Exogen will assist JEV using its expertise in deploying ESG solutions.

Capella

Capella Partners serves as JEV's senior technical advisor, providing due diligence, IP development, industrialization, and commercialization advisory for Jericho's low-carbon investments. Capella is an asset management firm focused on energy transition. This includes Jordan Urbach who previously led internal venture capital at McKinsey & Co and Product Manager for over 20 internal startups at McKinsey Solutions, as well as Romi Kardi who has facilitated over \$100M of investment into 17 ESG-oriented technology companies that have a collective valuation of over \$8B.

Financials

Capital Structure

JEV currently has 234.9M shares outstanding (including its recent equity financing) as well as 19.8M options and 30.0M warrants (6.3M and 13.0M are ITM respectively). The Company has \$3.3M in debt and \$1.4M in cash, including its recent private placement. In January, JEV announced that it refinanced and expanded its senior secured revolving credit facility for its O&G JV, increasing it by 23% to \$7.0M at Chase Prime.

FD ITM Shares Calculation	
Basic Shares Outstanding	234.9
Dilutive ITM Shares	19.3
Proceeds	\$2.6
Repurchased Shares	11.0
Adj. Dilutive ITM Shares	8.3
FD ITM Shares	243.2
Full Diluted	284.7

Figure 34: Capital Structure (Treasury Stock Method)

Financial Forecast

Below are our consolidated financial projections for JEV over the next three years, drawing from each of the segment's financial projections as seen above.

Financial Estimates	FY22A	Q1/23A	Q2/23E	Q3/23E	Q4/23E	FY23E	Q1/24E	Q2/24E	Q3/24E	Q4/24E	FY24E	FY25E
Revenue (\$M)	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.6	0.9	1.3	3.1	10.4
COGS (\$M)	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.5	0.7	0.9	2.4	7.3
Gross Profit (\$M)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.7	3.1
Gross Margin	100%	100%	100%	100%	5%	9%	10%	15%	25%	30%	24%	30%
Income from JV	2.9	(0.1)	(0.1)	(0.1)	(0.1)	(0.4)	(0.0)	(0.0)	0.0	(0.1)	(0.1)	(0.2)
Adj. EBITDA from JV	1.6	0.2	0.2	0.3	0.3	1.1	0.3	0.3	0.4	0.3	1.3	1.2
Adj. EBITDA (\$M)	(2.3)	(0.6)	(0.9)	(0.9)	(0.9)	(3.4)	(0.9)	(1.0)	(0.9)	(0.9)	(3.7)	(1.7)
Adj. EBITDA Margin	N/A	N/A	N/A	N/A	N/A	N/A	-294%	-160%	-93%	-75%	-120%	-16%
Net Income (\$M)	(4.5)	(1.3)	(1.6)	(1.6)	(1.6)	(6.1)	(1.6)	(1.7)	(1.5)	(1.6)	(6.4)	(4.3)
EPS (Basic)	(0.02)	0.01	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)

Figure 35: Income Statement Forecast

Management

Brian Williamson – President & CEO

Mr. Williamson is President & CEO of JEV and brings over 25 years of experience in the energy industry. Brian began his career at Arthur Anderson where he worked with Fortune 500 and FTSE 100 companies and private firms on a variety of strategic initiatives, projects, and transactions. Mr. Williamson then became President and COO of the Harbor Group, a private equity-backed energy investment, trading, and risk management firm in New York. At Harbor, he led the evaluation, due diligence, and execution of both physical and financial energy asset transactions. He also oversaw the creation, trading, and risk management of energy-related products in various markets. From 2006 to 2012, Mr. Williamson managed the private equity platform for a New York-based financial institution. Brian is also a founding board member of the Tulsa Renewable Business Alliance. Mr. Williamson currently owns 3.1M shares, representing 1% ownership in JEV.

Dean Moretton – Chief Commercial Officer

Mr. Moretton is the Chief Commercial Officer of JEV overseeing HT's commercial activities and expansion to capitalize on the hydrogen boiler opportunity. Dean brings over 30 years of successful experience in global energy markets, developing, selling, and marketing innovative products. Prior to joining the team, Dean led Digital Solutions sales and partnerships for utilities on behalf of Larsen and Toubro (L&T), one of India's largest multi-national conglomerates. Dean previously served as President of ArcIT, Product Director at Alstom, and Manager at Arthur Anderson Consulting. He currently serves on the Board at Kankakee Valley Electric Cooperative.

Ben Holman – Chief Financial Officer

Mr. Holman is the CFO of JEV and brings over 20 years of experience in accounting and business administration in the oil and gas industry. His experience includes senior positions at Apco Oil and Gas International Inc., a former subsidiary of The Williams Companies and WPX Energy. Ben has been working with Jericho at its Tulsa operational headquarters since November 2017. Mr. Holman is a CPA, with a MAcc from the University of Tulsa.

Janet Reiser – President of Hydrogen Technology

Ms. Reiser is President of Hydrogen Technology at JEV and brings over 35 years of experience in energy management, engineering, construction, and telecommunications. Janet most recently ran the governmental Alaska Energy Authority. She is experienced in all phases of enterprise development and operations as well as in executive and technical management. Janet is a Chemical Engineer by education and has been honoured and recognized as one of the Top 50 Women in Hydrogen and Top 10 in Hydrogen Technology and Innovation.

Ryan Breen – Head of Corporate Strategy

Mr. Breen is the Head of Corporate Strategy at JEV and has been with Jericho since inception. Ryan is responsible for financial modelling, due diligence, structuring, and execution as well as new investments and capital formation and lending activities. Prior to joining JEV, Ryan worked as an Investment Banker at J.P. Morgan, based in New York, working within the Diversified Industrials Group focused on Multi-Industrial, Aerospace & Defense, and Transportation. While at J.P. Morgan, Ryan participated in transaction structuring, and execution, including M&A and Debt and Equity financings for Fortune 500 companies. Mr. Breen owns 16.8M shares, equating to 7% ownership.

Markus Seywerd – Director

Mr. Seywerd brings over 18 years of experience in quantitative analysis and trading strategies in equities, futures, and options to the Jericho team. Over the last decade, Markus was the Chief Investment Officer at Park Lane Capital SICAV plc in the U.K. Prior to that, Markus was a Quantitative Analyst/Portfolio Manager for the Trading and Risk division at SISU Capital. Markus was also a Portfolio Manager and Principal for Arbitrage Capital Management Inc. where he helped build the firm from \$1M to \$45M AUM.

Carolyn Hauger – Director

Ms. Hauger brings over 35 years of experience in advising leadership teams on financial business strategies across a broad commercial and technical spectrum. Currently, Carolyn is the CFO of WeSolar Inc., a solar development, acquisition, and management firm focused on low-to-moderate-income families. Prior to WeSolar, she was the CFO of Ten-Nine Technologies and CFO of LION. However, the majority of Carolyn's career was spent at P&G where she worked for over 25 years to become the CFO of North America FemCare and later the Global Financial Operations Executive where she led a team of over 50 employees.

Allen Wilson – Director – Mr. Wilson is an oil and gas professional, having founded Jericho Energy Ventures and previously served as its CEO. Prior to that, Mr. Wilson was CEO & Director at Newcastle Energy Corp. and President at Marine Drive Golf Club. Mr. Wilson currently serves as Director at Regents Park Securities, a brokerage firm based out of the U.K. Mr. Wilson owns 2.0M shares, representing 1% ownership.

Nicholas W. Baxter – Director

Mr. Baxter is a seasoned energy professional bringing over 20 years of resource exploration and development experience to the JEV team. Mr. Baxter currently serves as President and CEO of Eurasia Energy and has past experience as Co-Founder of Addison Baxter Limited (geophysical geological services, acquired in 1992), COO of AB Geoscience Corporation, and as an independent oil and gas consultant. Mr. Baxter owns 1.1M shares, equating to 0.5% ownership of JEV.

Risks

Slow Adoption – Above Average

HT is selling a premium innovative product to clients that have been using traditional boilers for decades, this can lead to pushback and delayed adoption as HT convinces clients of its advantages. We think that JEV doing feasibility studies with 30+ clients before deploying units is a smart way of mitigating this risk as clients can ensure the boiler fits their operational requirements.

Lack of Operating History & Profitability – Above Average

Hydrogen Technologies has a lack of operating history since it is a new product and a nascent industry. Therefore, our estimates are subject to volatility and uncertainty to the downside and upside. Furthermore, HT will not be profitable for multiple years. The stability and profitability of JEV's oil and gas assets counter this argument.

Dilution Risk – Below Average

Jericho's JV assets in Oklahoma provide cash flow to the business which is used to fund the R&D for HT. While this will fund a portion of the HT commercialization, we still anticipate JEV to raise equity capital over the next few years.

Illiquidity – High

JEV stock is highly illiquid, only trading 16.6K shares per day (~C\$4K/day). This makes an investment in JEV risky for institutional investors and some retail investors that are not comfortable with long-term holding periods.

Appendix

		O&G Assets EV/PV-10				
		0.5x	0.6x	0.7x	0.8x	0.9x
PV-10	\$32M	C\$0.30	C\$0.40	C\$0.40	C\$0.40	C\$0.40
	\$38M	C\$0.30	C\$0.40	C\$0.40	C\$0.40	C\$0.40
	\$44M	C\$0.40	C\$0.40	C\$0.40	C\$0.40	C\$0.50
	\$50M	C\$0.40	C\$0.40	C\$0.40	C\$0.50	C\$0.50
	\$56M	C\$0.40	C\$0.40	C\$0.50	C\$0.50	C\$0.50

		HT 2024E EV/Sales				
		3.0x	3.5x	4.0x	4.5x	5.0x
2025E HT Sales	\$6M	C\$0.30	C\$0.30	C\$0.30	C\$0.30	C\$0.30
	\$8M	C\$0.30	C\$0.30	C\$0.40	C\$0.40	C\$0.40
	\$10M	C\$0.30	C\$0.40	C\$0.40	C\$0.40	C\$0.50
	\$12M	C\$0.40	C\$0.40	C\$0.40	C\$0.50	C\$0.50
	\$14M	C\$0.40	C\$0.50	C\$0.50	C\$0.50	C\$0.60

Figure 36: Target Price Sensitivity

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SELL: The stock is expected to generate negative returns over the next 24 months.

NOT RATED (N/R): Atrium does not provide research coverage on the respective company

RATING	COVERED COMPANIES
BUY	8
HOLD	0
SELL	0

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