

From: Eiric Skaaren
To: CSLC Commission Meetings
Cc: Kristopher Evors
Subject: 10/21/2021: Item 32
Date: Monday, October 18, 2021 11:38:20 AM
Attachments: 5MW-309MW 5.pptx

Attention: This email originated from outside of SLC and should be treated with extra caution.

TO: CALIFORNIA STATE LANDS COMMISSION

In relation to the upcoming offshore wind pilot, we at Hydroelectric Corporation, would like to give our support to the project.

In addition, we would like to suggest that the commission add a «power booster» to the project, with the aim to provide balancing power to the onshore grid when the wind goes dead.

Enclosed you find a short presentation of the proposed technology, and each jackup are environmental friendly with no risk for any oil spill. In addition, the jackups only need about 1 acre offshore to produce 1 TWh a year, compared to a minimum of 100 000 acres needed for offshore wind to produce the same amount of electricity.

The technology work in conjunction with offshore wind, but its possible to install stand alone assets, where a separate subseacable will be required.

To put things in perspective, 40 of our largest powerplants would provide enough electricity to meet the annual electricity demand in California, which include residential and the industrial sector.

Brgds, Eiric Skaaren
President & CEO
Hydroelectric Corp.

[REDACTED]

[REDACTED]

Cell: [REDACTED]
Hydroelectriccorp.com

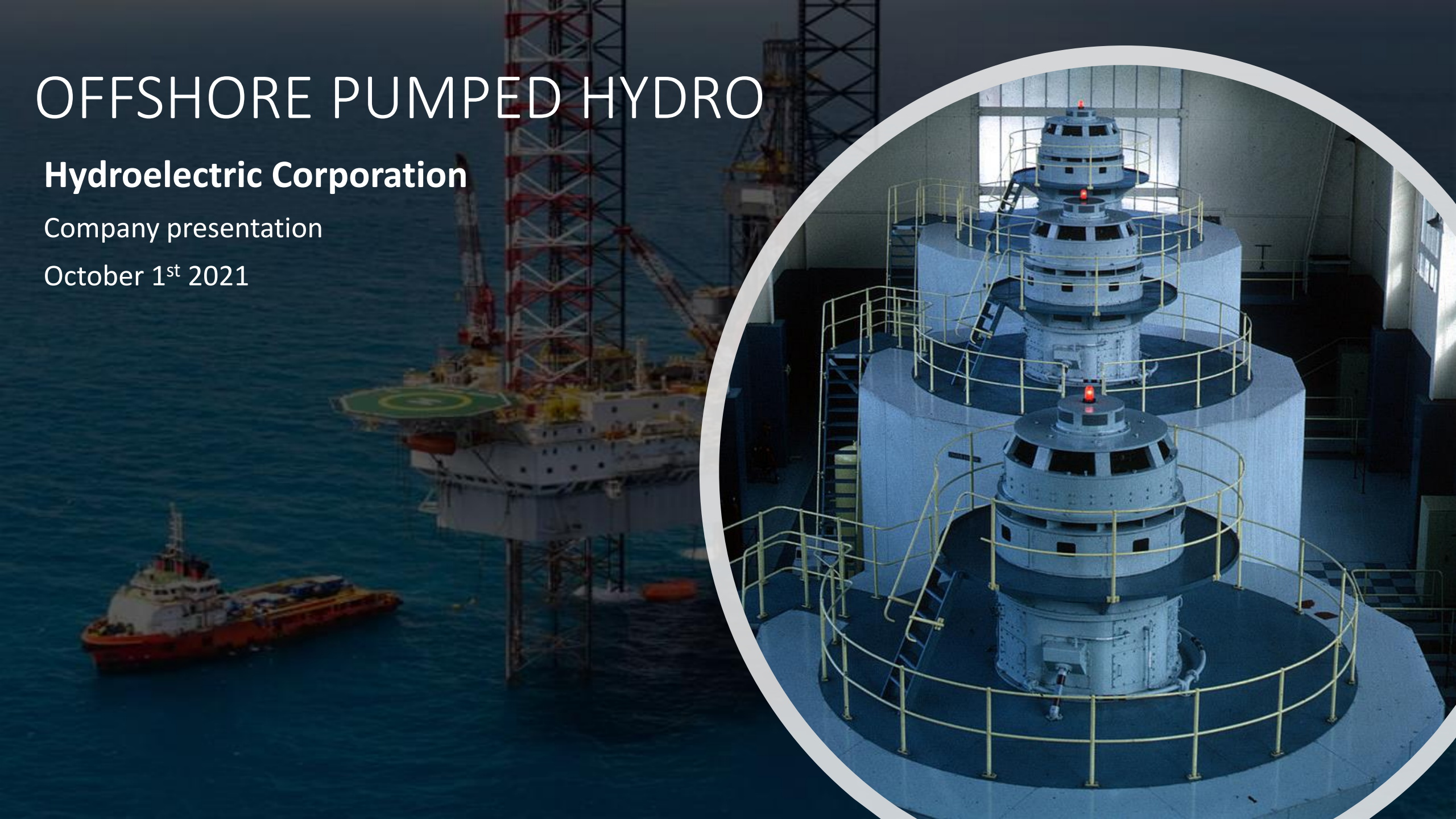
The attached material was submitted to the Commission as public comment for the Commission's October 21, 2021 meeting. The Commission has posted it on the CSLC website to provide the public with access to a true and correct copy of the submitted material in advance of the meeting. The Commission does not endorse this material, and has not vetted or curated it. Additionally, the Commission has not curated or vetted graphics, photos, and other visual images contained in this material.

OFFSHORE PUMPED HYDRO

Hydroelectric Corporation

Company presentation

October 1st 2021



PROVIDER OF ENERGY SECURITY IN A CLEAN & SUSTAINABLE WAY

- Hydroelectric Corporation is uniquely positioned in an exploding market offering zero carbon emission of sustainable energy production.
- Hydroelectric Corporation is a zero-debt company, offering financial stability through cash reserves providing the liquidity to facilitate long-range growth.





Value Holdings

Patented Zero Carbon Emissions power generation technology

- Strong Patent – high value potential
- Demand for green electrical power generation increasing at extreme rate
- High density, low footprint technology
- Designs to incorporate and recycle existing structures in achievement of goals
- Easily adaptable to Hydrogen Production for application flexibility
- First renewable to operate continuously

Partnerships

Equipment Superiority

- GE Energy
- Atlas Copco
- Siemens
- TDC (UK)
- Foster Equipment

Power Trading & M&A Advisory

- NVOI Securities

Engineering Excellence and Commitment

- MacIvor Engineering

Construction Exceptionalism

- Kiewit Corporation
- Lamprell plc
- CIMC Raffles

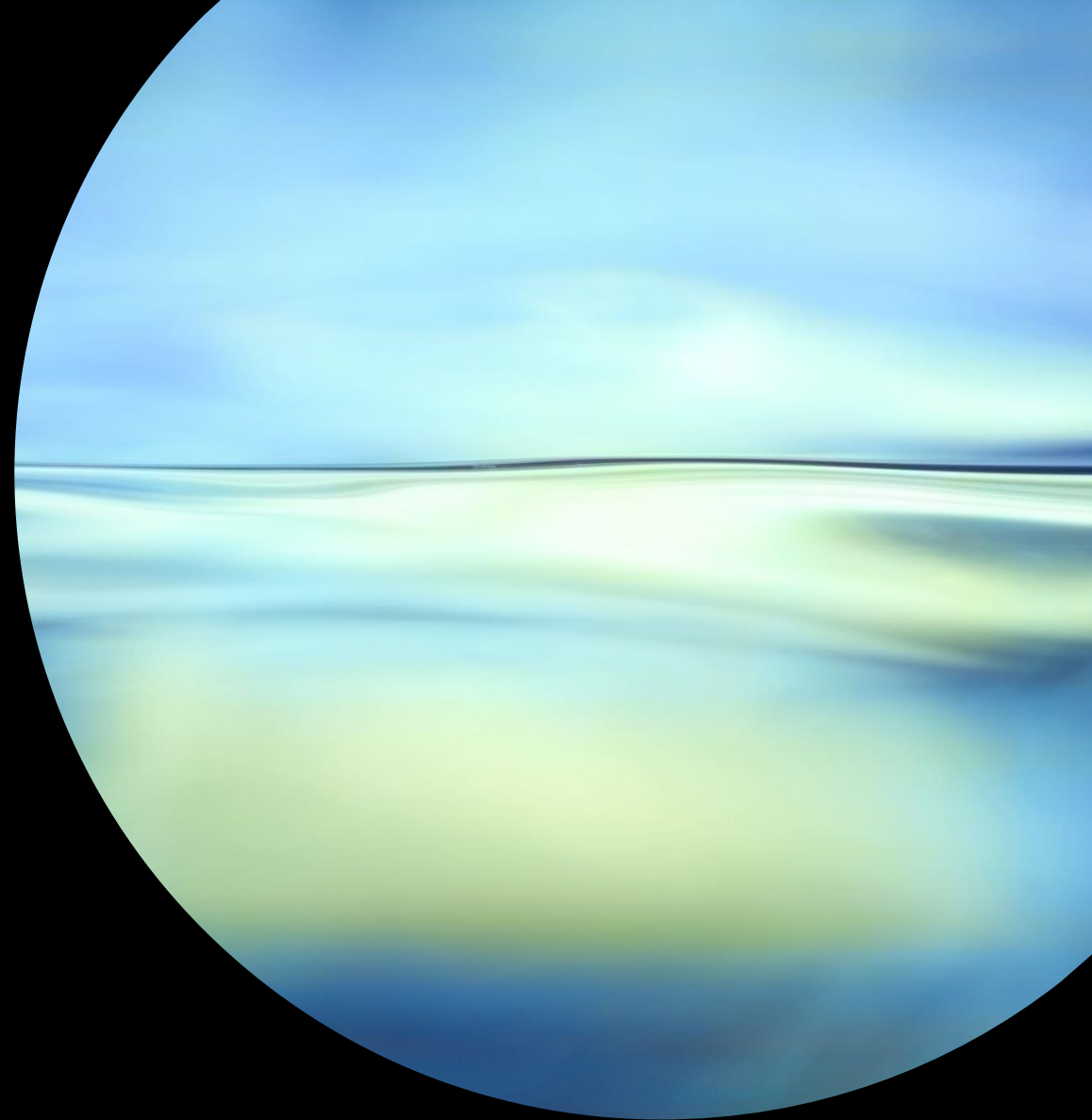
Investment & Strategy

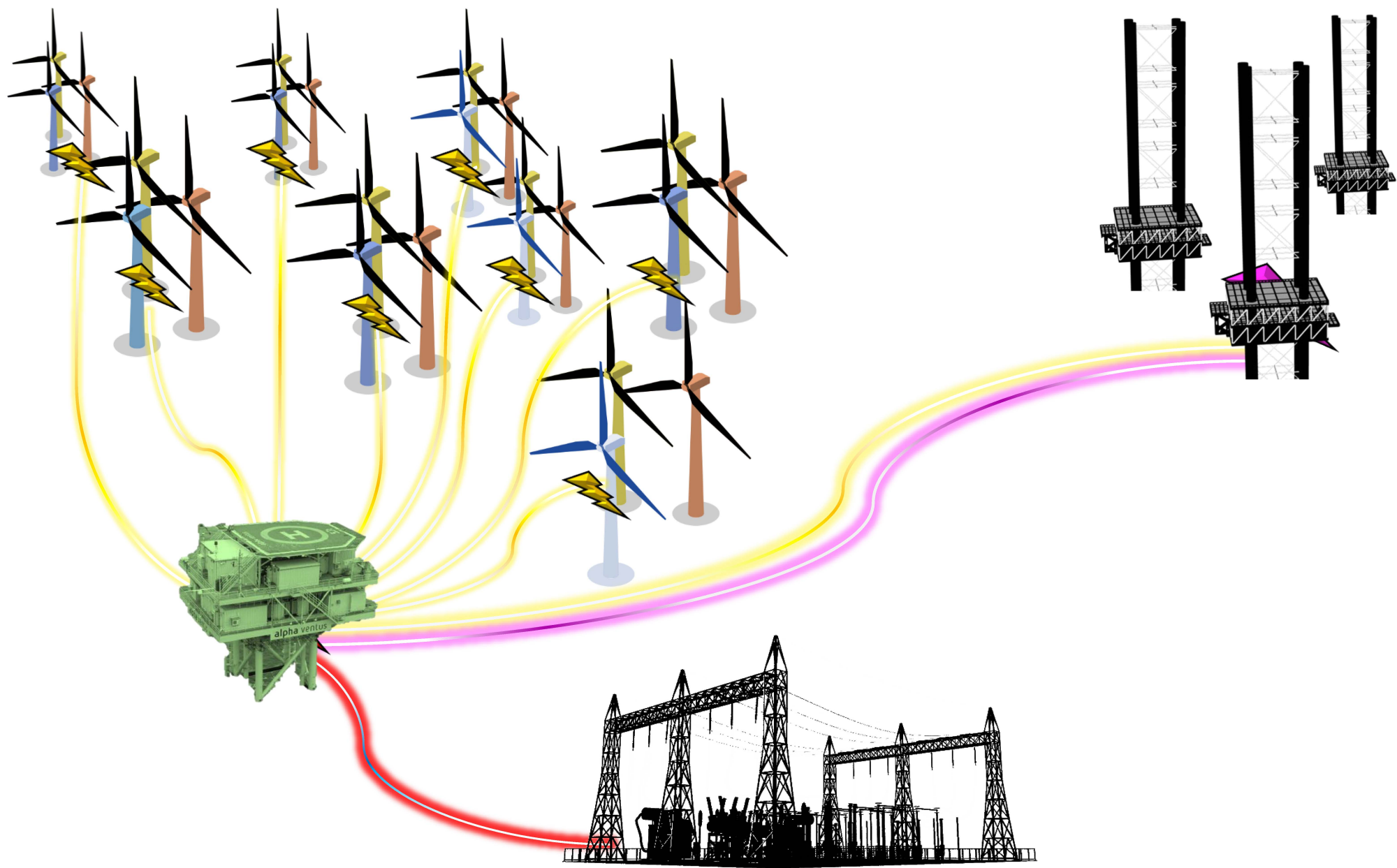
Advancement of Technology

- Hydroelectric has invested \$26MM into development and design since 2013, as confirmed by CPA in Annual report
- Technology development has required more than 35,000 manhours

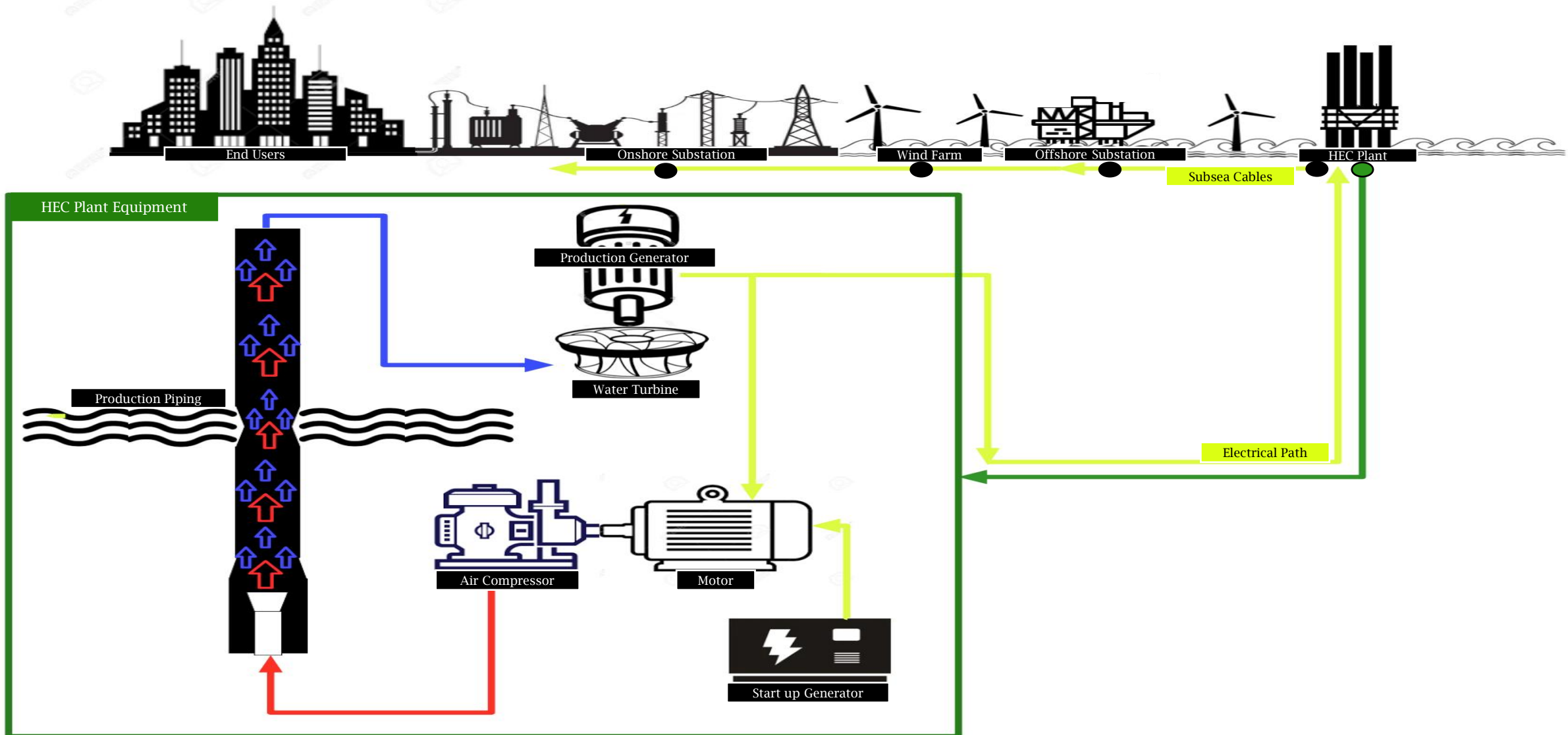
Shareholder strategy & Subsequent offering

- Grow company by building an excessive amount of offshore pumped hydro power plants
- Add services to product offering, such as construction and operations
- Subsequent offering, opens for industrial investors:
http://hydroelectriccorp.com/Application_Form.pdf





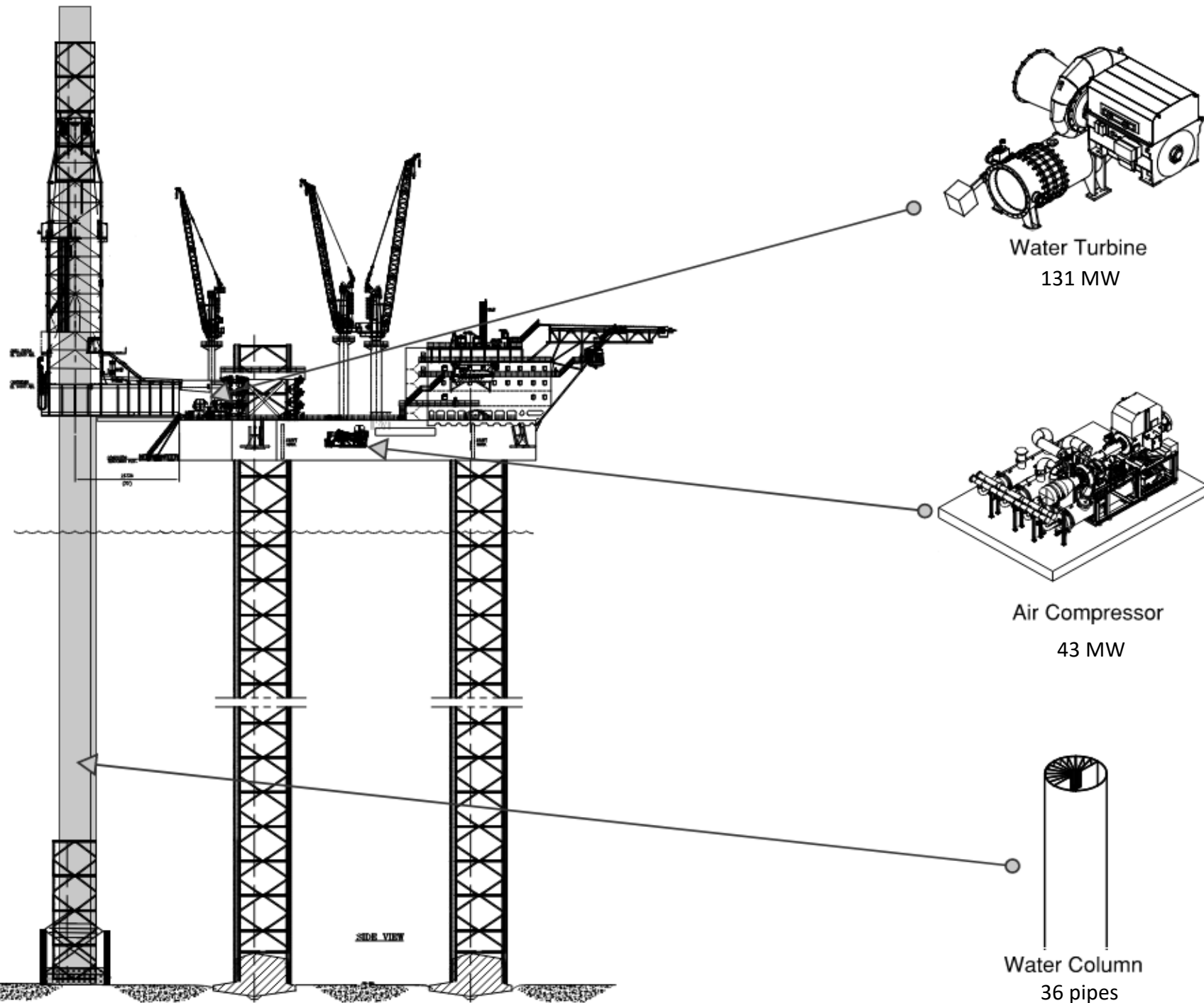
Equipment overview for the HEC plant



88 MW Jackup

OPEX:
\$40k per MW

CAPEX:
\$145m
\$85m equipment
\$40m jackup
\$20m subseacable



Fabrication Drawings:
<http://hydroelectriccorp.com/20MWdesign.pdf>

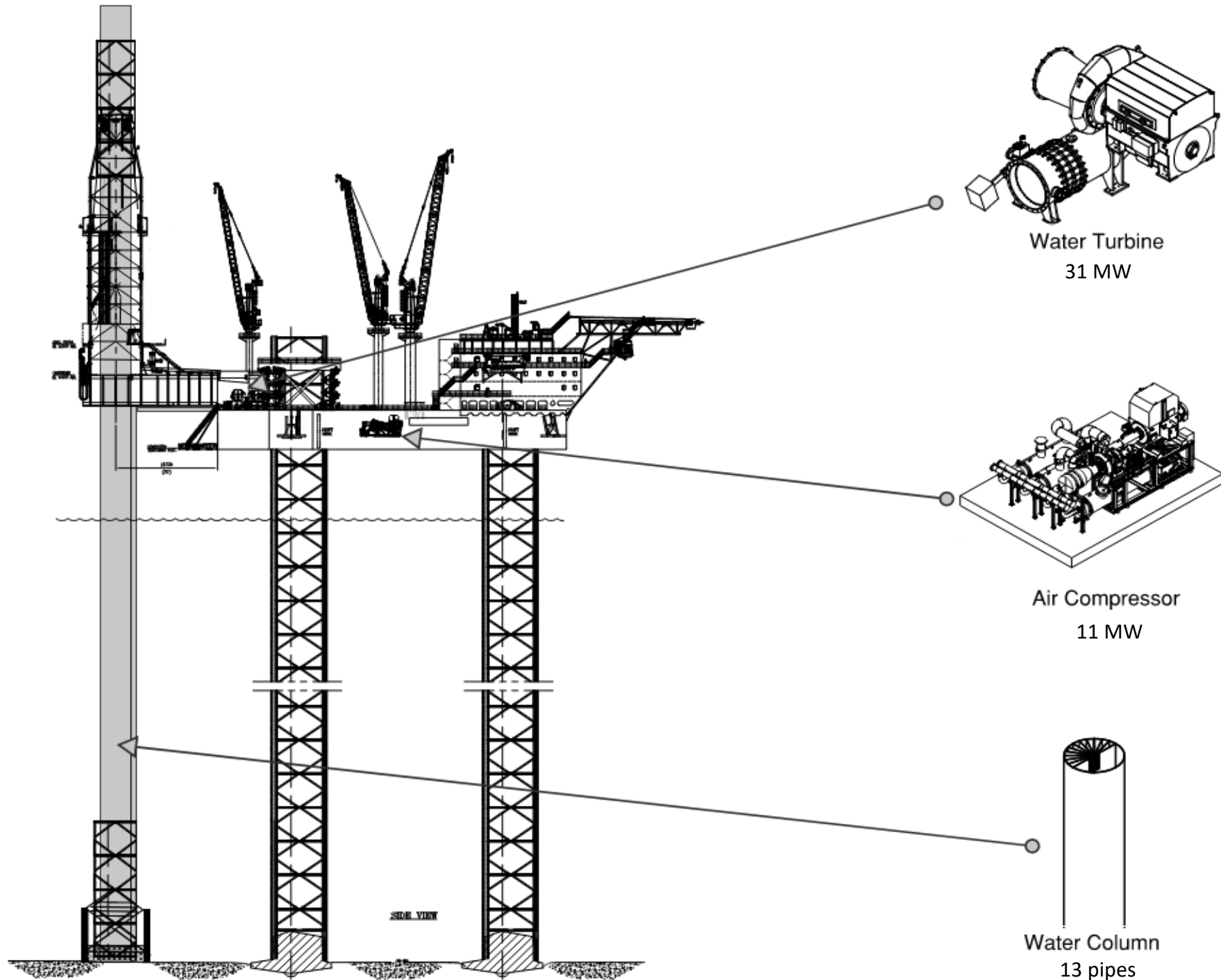
20 MW Jackup

OPEX:
\$25k per MW

CAPEX:
\$31m

\$20m equipment
\$10m jackup
\$1m subseacable

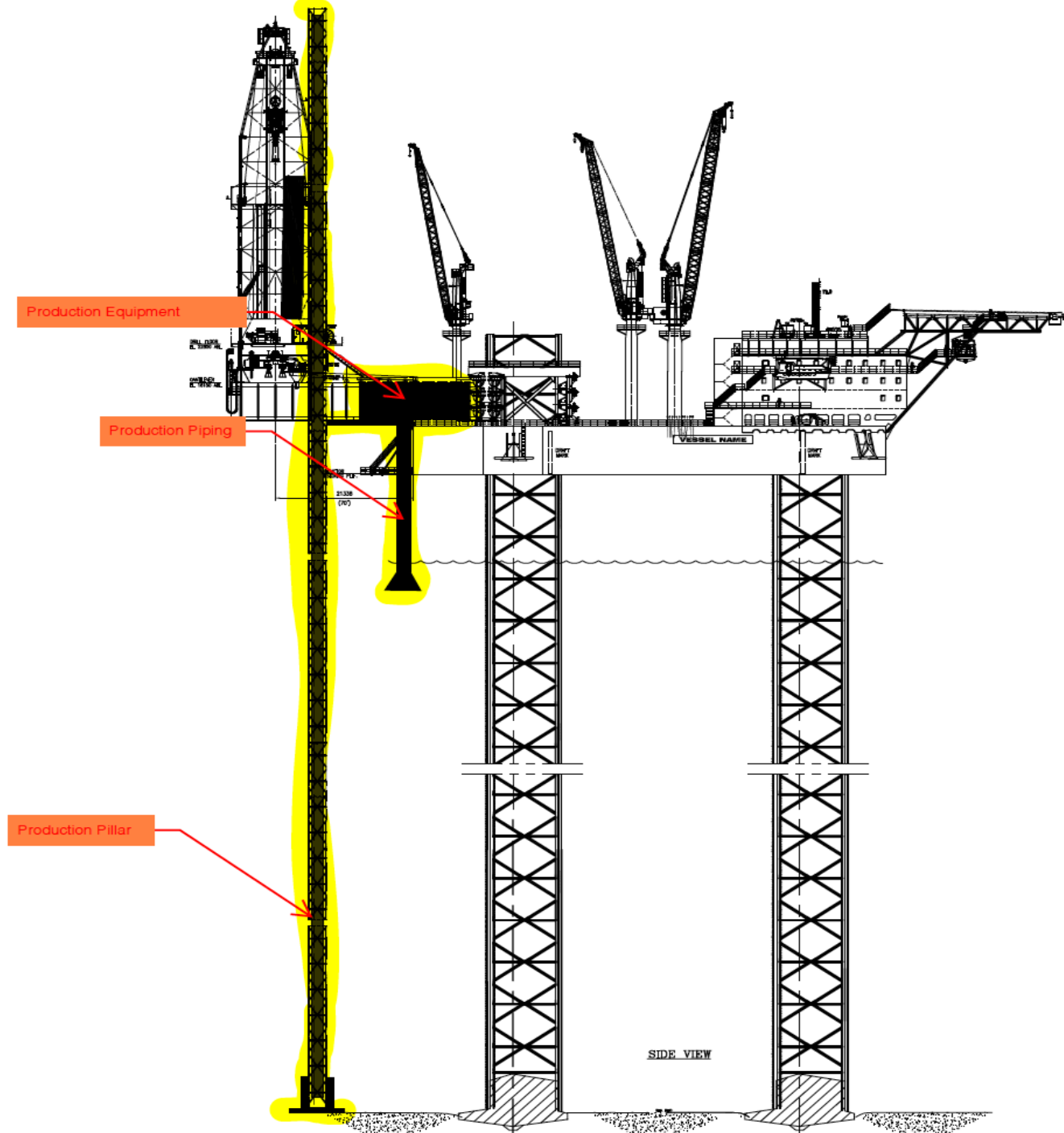
Fabrication Drawings:
https://hydroelectriccorp.com/20MW_DD7_Design.pdf



5 MW Jackup

OPEX:
\$25k per MW

CAPEX:
\$16m
\$7.5m equipment
\$7m jackup
\$1.5m subseacable



Equipment overview:

- 1 jackup (minimum 114m deep)
- 1 pump (2.5 MW compressor)
- 1 water turbine (7.3 MW output)
- 1 diesel startup generator
- 1 Production pipe (100m height)

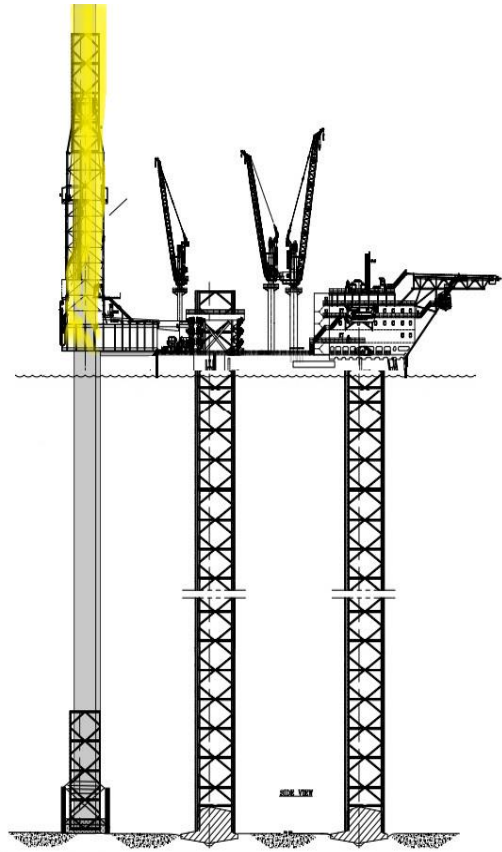
Output in MW:

- Pump consumption 2.5MW
- Gross output 7.3 MW
- NET OUTPUT 4.8-5 MW

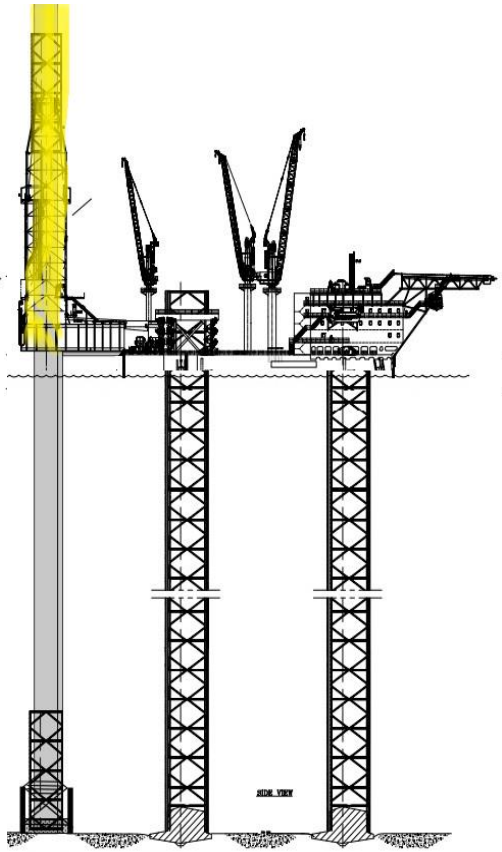
PILOT CAPEX \$16M:

- Major portion of the costs relates to the water turbine, and purchase of a second hand jackup
- Costs by connecting to Utsira Nord depend on the cable length
- The jackup re-classification will be handled by ABS or DNV

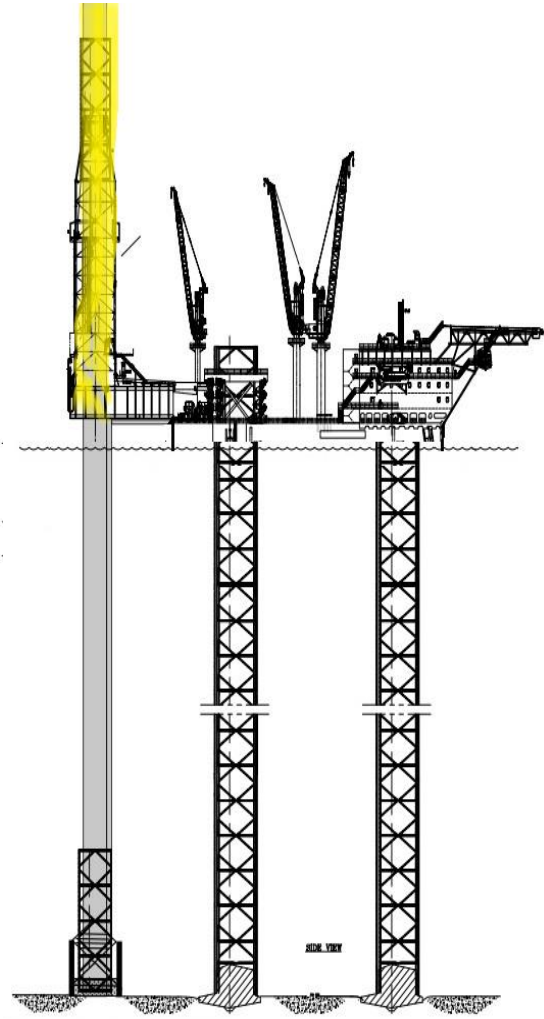
13 pipes * 2.6 m³/s
Pump: 10.8 MW
Gross output: 31.6 MW
Net output: 20.8 MW
Net pr pipe: 1.6 MW



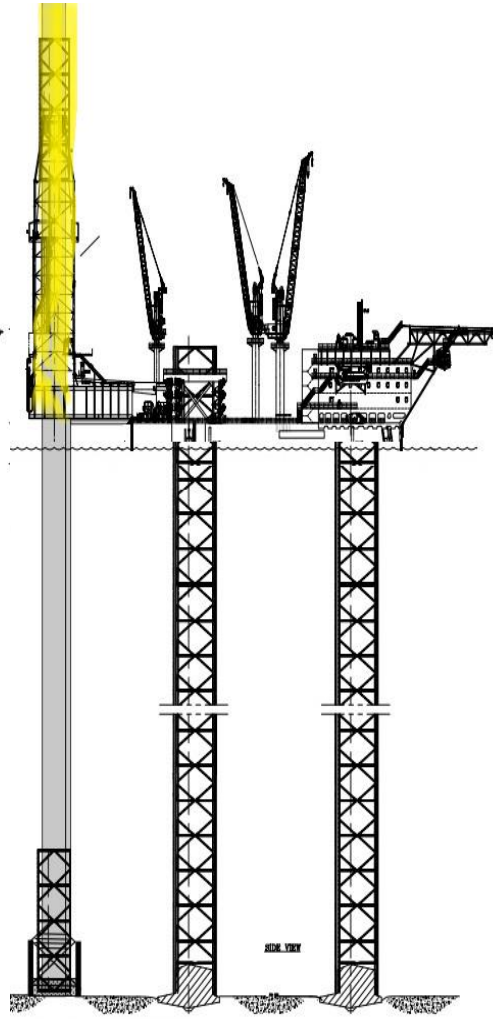
36 pipes * 2.6 m3/s
Pump: 43 MW
Gross output: 88 MW
Net output: 45 MW
Net pr pipe: 1.25 MW



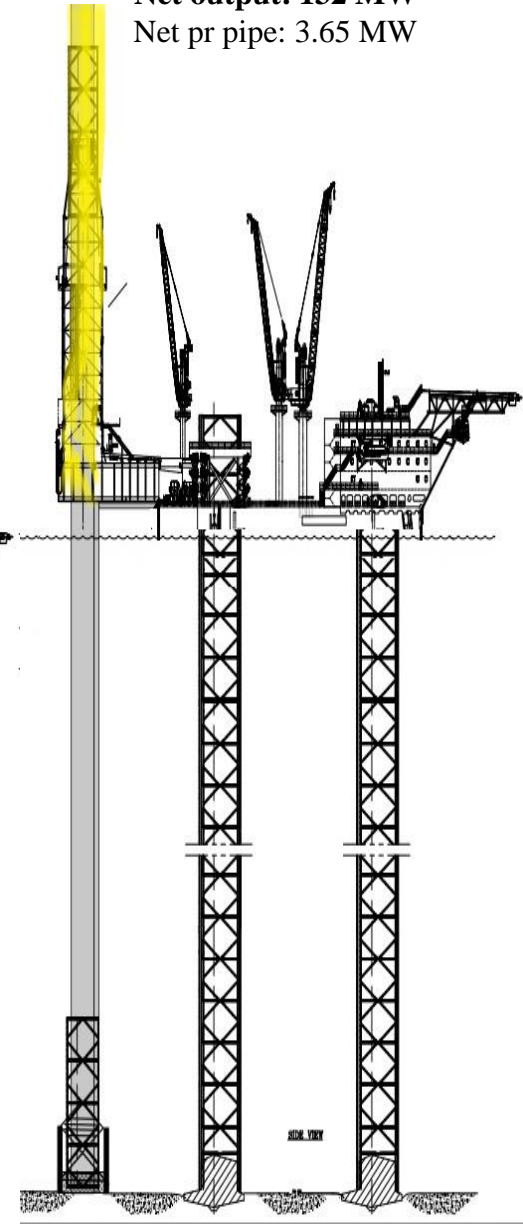
36 pipes * 2.6 m3/s
Pump: 43 MW
Gross output: 120-131 MW
Net output: 77-88 MW
Net pr pipe: 2.14-2.44 MW

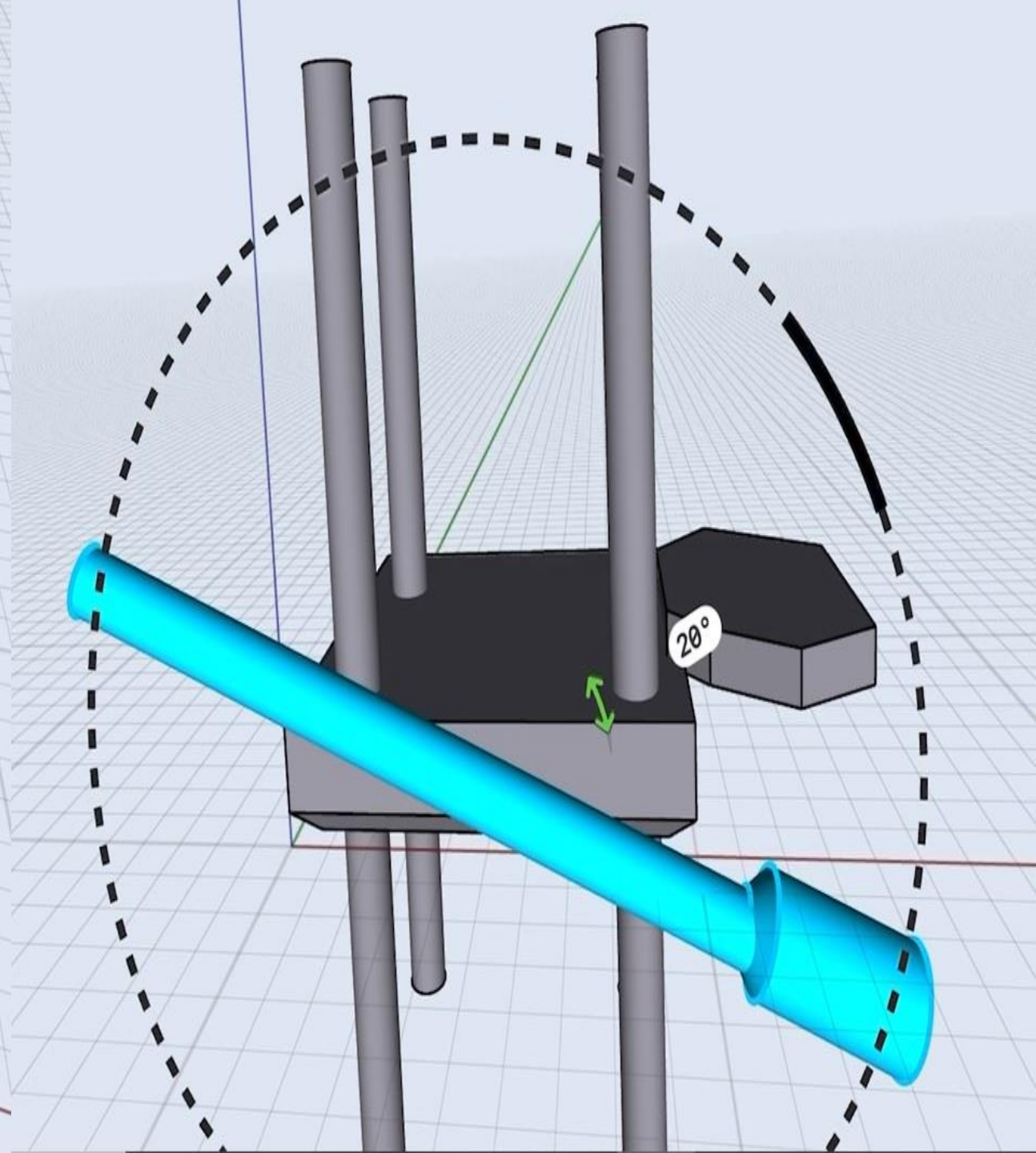
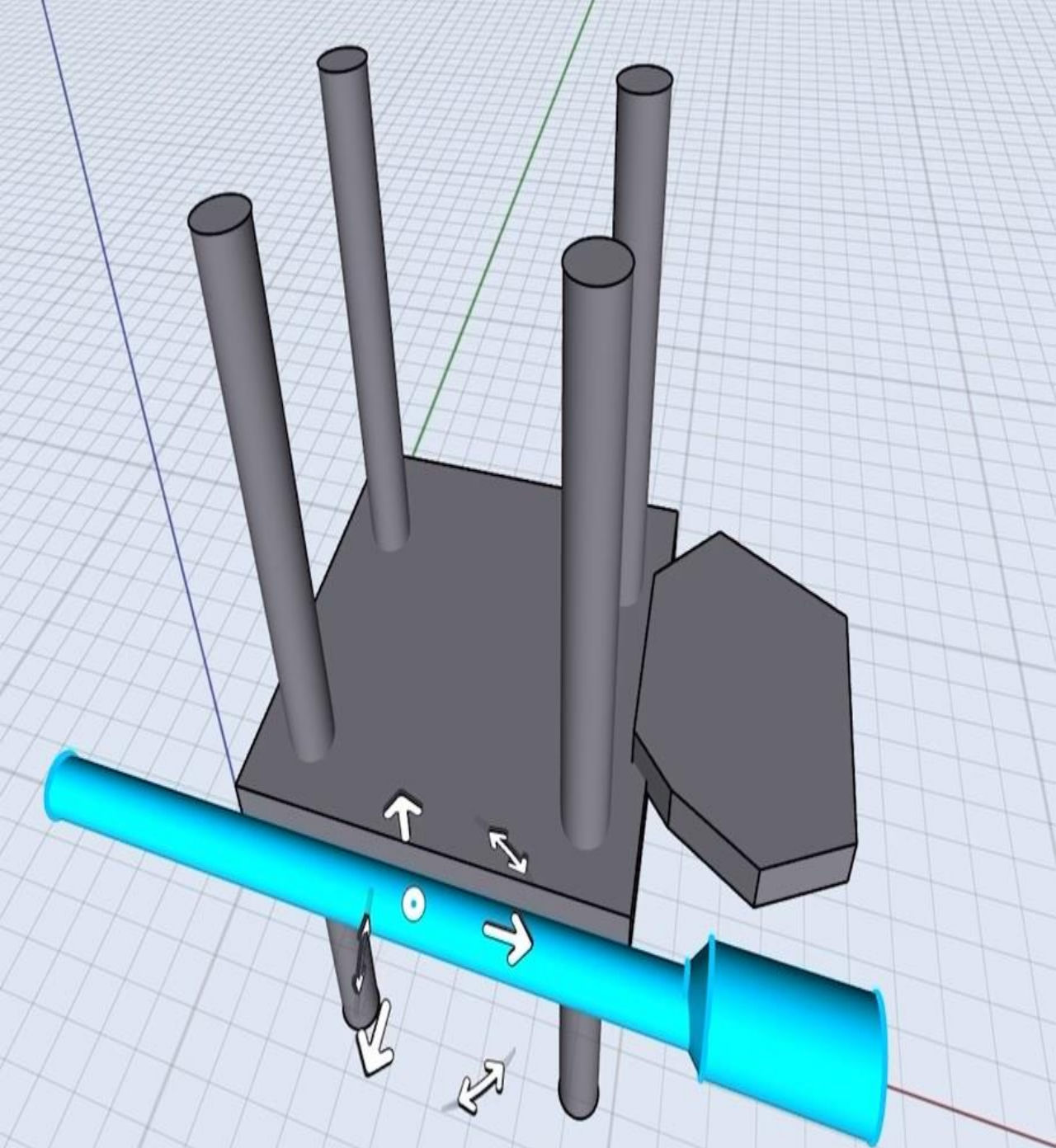


36 pipes * 2.95 m³/s
Pump: 43 MW
Gross output: 149 MW
Net output: 106 MW
Net pr pipe: 3 MW



36 pipes * 2.6 m³/s
Pump: 43 MW
Gross output: 175 MW
Net output: 132 MW
Net pr pipe: 3.65 MW



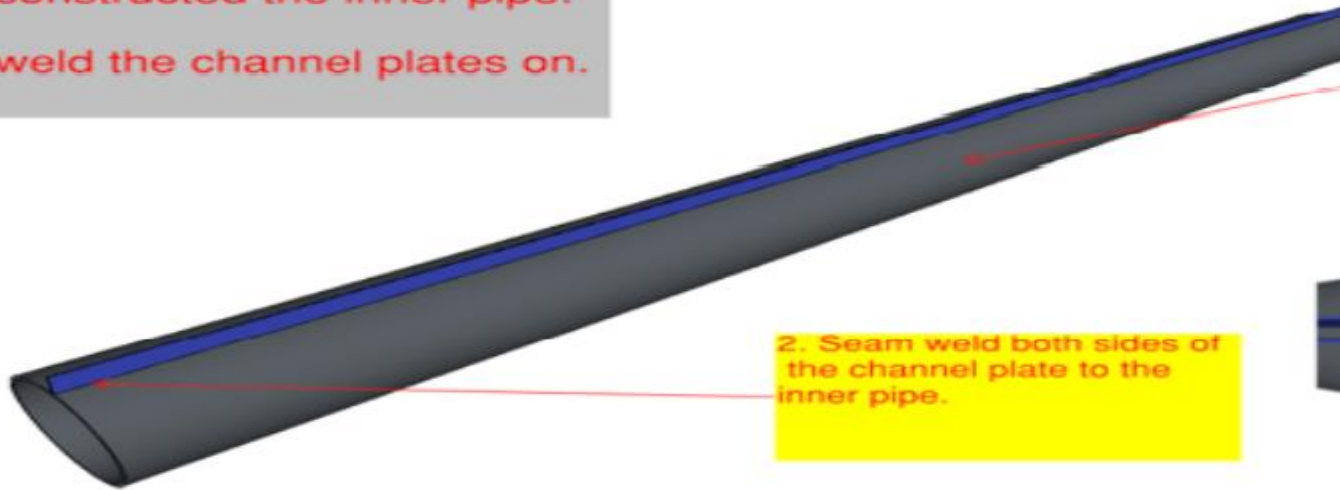


The installation meets all current practices

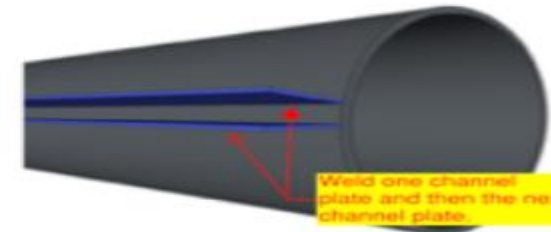
- By utilizing a jackup, the rig will install itself without the need for additional installation vessels
- As the production pipe consist of multiple inner pipes, giving substantial strength to the steel, there are no risk of transporting the pipe in a horizontal position, before its pivoted to a vertical position
- At the dock in the shipyard, the “pipe” will me mounted on a “joint” centered at the rig, making the pipe capable of being “pivoted” later on at the preferred offshore location
- Both ends of the water pillar will be sealed, making it easier for the tug boat to transport the rig
- Once the jackup are in the preferred position offshore, the sealing on the lower side of the pillar will be removed, making the pipe sink toward a horizontal position.
- The installation of the pillar will be supported by a crane, which comes with the second hand rig
- To avoid un-necessary stress on the jackup structure, the pipe will rest on the seafloor

Protective coating allow for 20 yr operation

1. constructed the inner pipe.
2. weld the channel plates on.



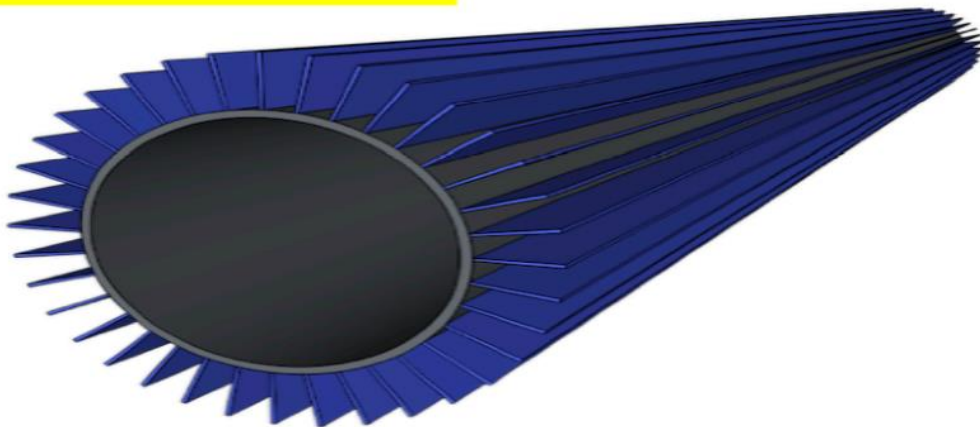
1. Seam weld the inner pipe sections together.



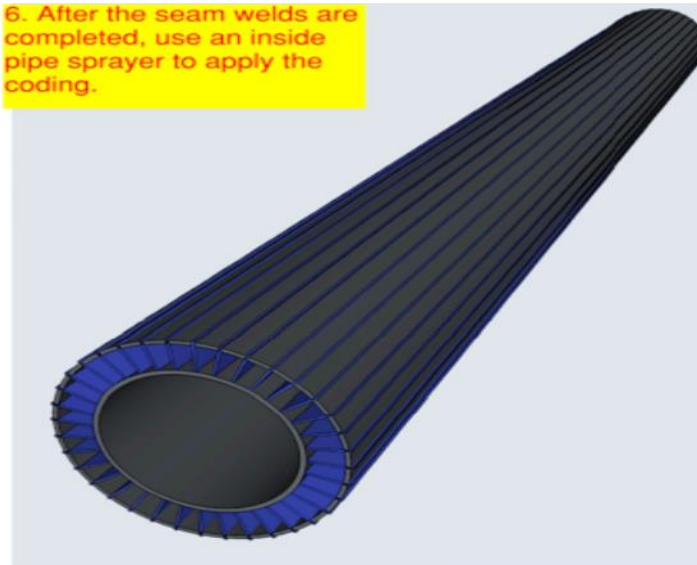
2. Seam weld both sides of the channel plate to the inner pipe.

Weld one channel plate and then the next channel plate.

4. Prepare the metal for coding by removing any debris or corrosion from the surface.



6. After the seam welds are completed, use an inside pipe sprayer to apply the coding.



PROVEN CONCEPT FOR OFFSHORE PUMPED HYDRO

Purpose

Since 2013, Hydroelectric Corporation has performed a series of studies, pilot tests, and computer aided validations which has been executed by third party experts. The tests performed has identified the most optimal method of pumping water up a water column, which again confirm a positive energy balance by utilizing the water. These tests were performed analytically and physically to determine the water output at the top of a water column. The physical pilots were performed in multiple locations outside the coast of Norway and the United States. This report is to combine the results of all the studies and pilot tests that have been done.

Studies and Testing Summery

The approach was to perform analytical studies to optimize the design and determine the water column volume for multiple phase pumping. Once determined, we took the results of the analytical feasibility and adapted it to the physical feasibility. This approach was performed several times with multiple parties involved.

The five main studies and testing overview:

- **Norway feasibility;** determined the optimal column diameter and acceptable depths for testing.
- **North Sea Pilot;** determined that it was possible to move water up the water column, and how much.
- **USA Feasibility;** determined water output, MW usage, and conceptual plant design.
- **USA Pilot;** gas inlet nozzle testing, column volume changes, velocity effects, and confirm required air needed.
- **CFD;** computer aided engineering simulation to confirm the overall concept.

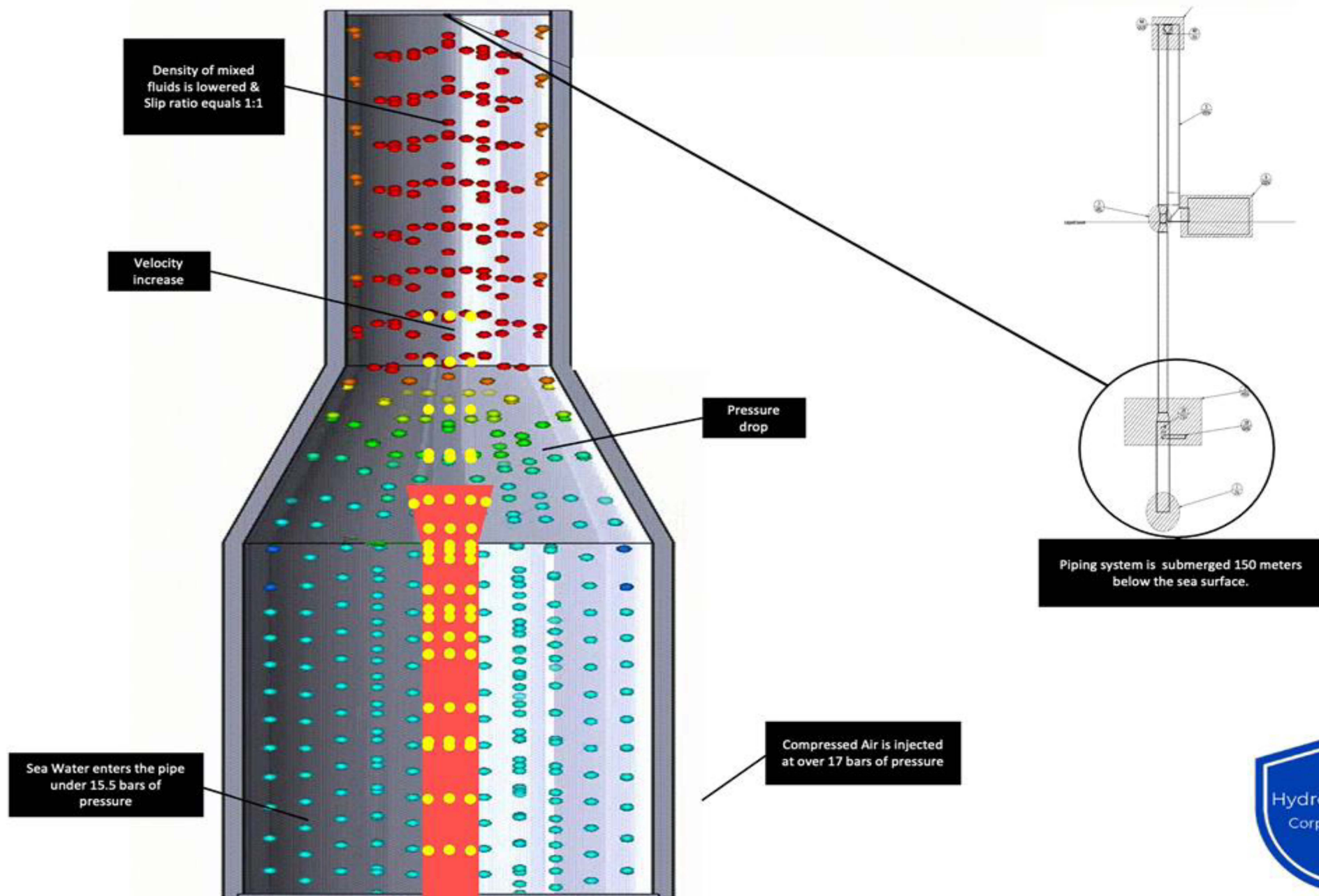
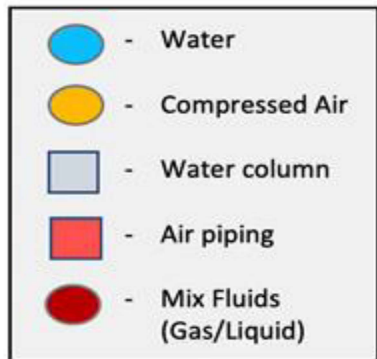


2.3 Conclusion

In this study, we present a complete set of two-phase analytical models for the overall pumping system. The whole system consists of a gas nozzle and production water column. It was found that the water was able to move upward passed the equilibrium, flowing past the top of the water column. The water column was able to achieve the volume flow rate of 2.9 m³/s in under 500 seconds. This data is less than 3% from the feasibility study previously presented and confirms creating a flow of water with a gas lift system offshore. Further models can be run to optimize the pumping system for further flow increases and efficiencies. These models will consist of inputting of particles for the site location of the pumping systems to be installed.

[SEP] More studies on nozzles designs can be made to improve efficiencies of the stage flow regimes.

Goal Name	Unit	Value	Averaged Value	Minimum Value	Maximum Value	Delta	Criteria
Produced Volume of Water	[m ³ /s]	2.98	2.95	2.98	2.92	0.084	0.047
Produced Volume of Air	[m ³ /s]	1.72	1.70	1.72	1.69	0.000019	0.01971



System at Work

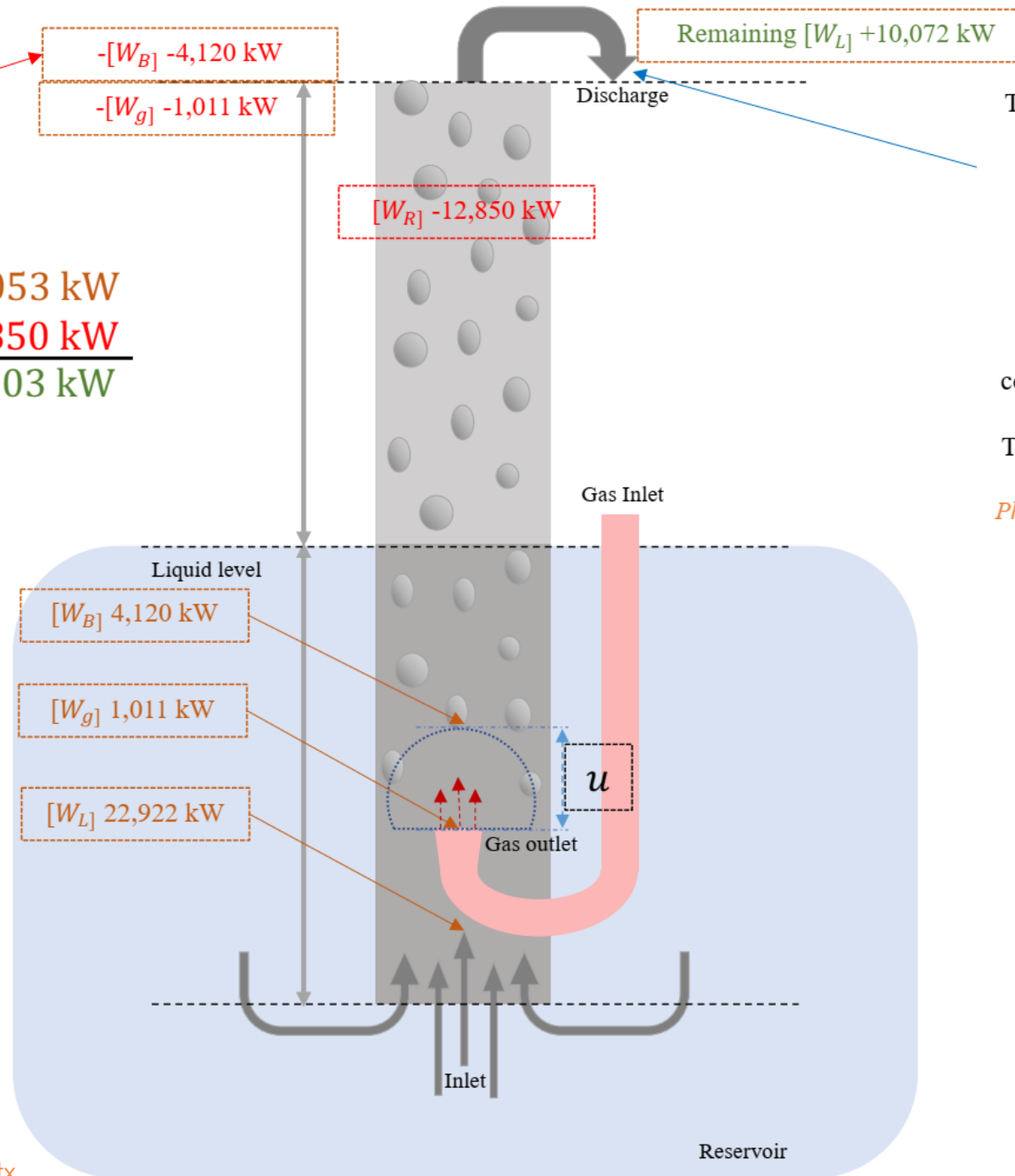
The work force from the injected gas and the buoyancy is returned to the atmosphere.

$$\begin{array}{r} 28,053 \text{ kW} \\ - 12,850 \text{ kW} \\ \hline 15,203 \text{ kW} \end{array}$$

Kinetic Force Energy at work to move the mixture vertically up the water column.

$$\begin{array}{r} 4,120 \text{ kW} \\ 1,011 \text{ kW} \\ + 22,922 \text{ kW} \\ \hline 28,053 \text{ kW} \end{array}$$

$[W_g]$ = Work force from injected gas
 $[W_B]$ = Work force from buoyant forces
 $[W_L]$ = Work force from dynamic pressure of the liquid
 $[W_R]$ = Work required to lift the mass of mixture up the water column



The amount of water that is produced at the top of the water column will fall down a penstock. As the water falls down the penstock, it gains the g-factor and is processed through the water turbine.

For the system to work, operating gas compressors is required. In addition to the gas compressors, the system has losses. These consumptions and losses have been calculated and deducted below.

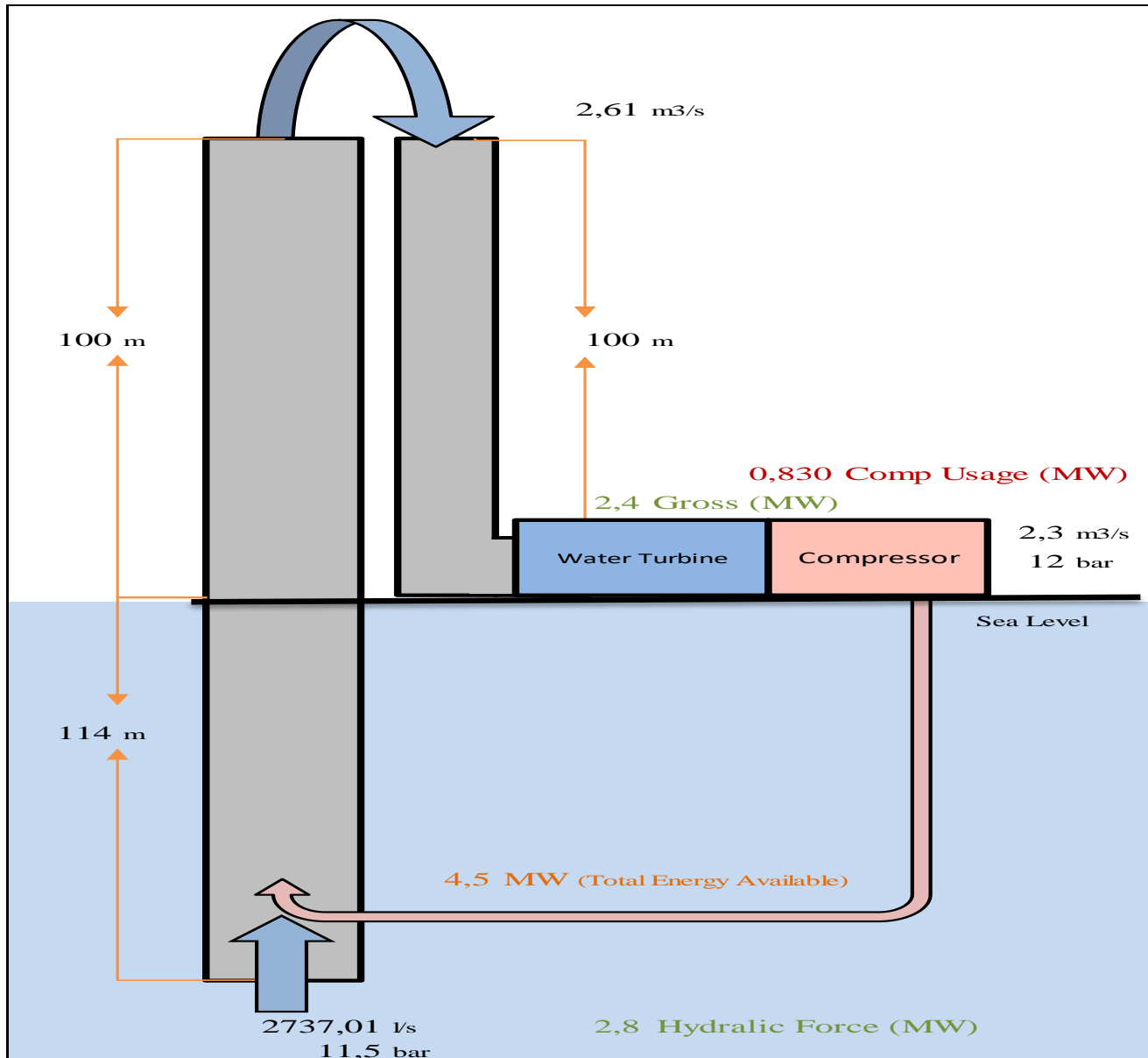
Please Note: The system's losses are done with CFD (3D modeling).

$$\begin{array}{r} +10,072 \text{ kW} \text{ -Remaining Energy} \\ -1,350 \text{ kW} \text{ -Input Energy} \\ + \quad -5,661 \text{ kW} \text{ -Energy Losses} \\ \hline +3,061 \text{ kW} \text{ -Energy Net Gain} \end{array}$$

Net after total losses - a positive energy balance remains

3,061 kW

Feasibility results for a 20 MW plant with 13 pipes



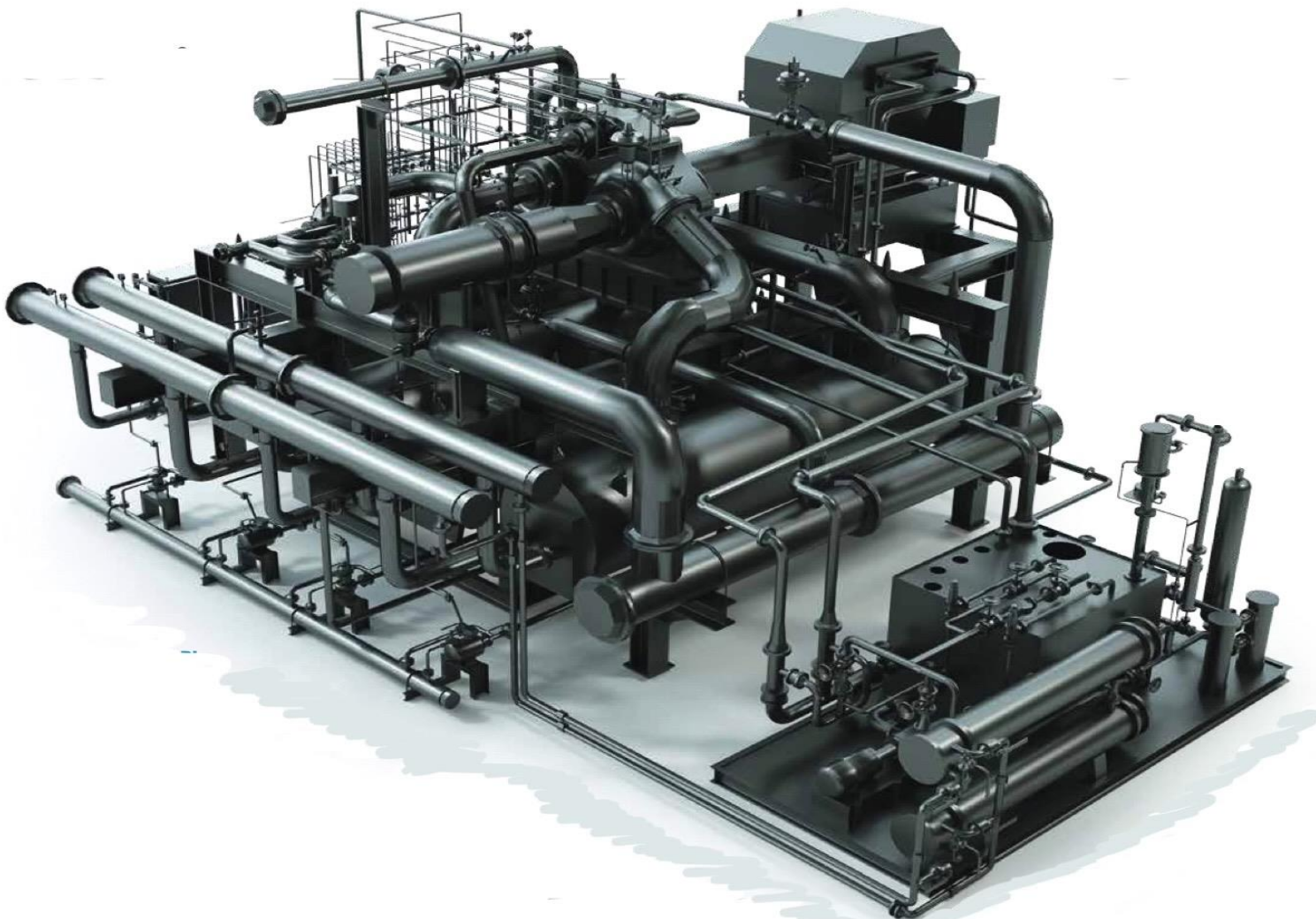
Source: <http://hydroelectriccorp.com/ALFD%20TECH-180369-%2020MW.xlsm>

Desired MW	20,0	MW
Compressor Driver Demand	10794,5	kW
Compressor Driver Demand per pipe	830,0	kW
Compressor Output Volume	32,0	m ³ /s
Production Output	20,9	MW
Energy Balance Results		
Energy Used from Comp	10,8	MW
Hydraulic Force (FP) Energy per pipe	2,8	MW
Hydraulic Force (FP) Energy per pillar	36,3	MW
Available System Energy	47,1	MW
Energy Production Gross	31,7	MW
Energy Production Net	20,9	MW
Energy Ratio	2,9	:1


Electrical Production per Pillar:	
<i>density (kg/m³)</i>	1024,7369
<i>efficiency</i>	0,93
<i>flow (m³/s)</i>	33,88
<i>head (m)</i>	100,00
<i>Gross output kW=</i>	31675
<i>Gross output MW=</i>	31,7
<i>Net output kW=</i>	20881
<i>Net output MW=</i>	20,9

Source: http://hydroelectriccorp.com/No_MACROS_20MW.xls

A 11 MW pump will be able to push 33,88 m3 of water pr sec



COMPRESSOR POWER CONSUMPTION ANALYSIS



Atlas Copco Gas and Process

INTEGRALLY GEARED COMPRESSOR
DATASHEET (API 617-8th, Part 3)
US UNITS (psi)

1	APPLICABLE TO:	PROPOSAL
2	FOR	Mactiver
3	SITE	TSD
4	SERVICE	Air (offshore)
5	MANUFACTURER	Atlas Copco
6	MODEL	GT087L4K1
7	APPLICABLE STANDARD	<input type="radio"/> ISO <input checked="" type="radio"/> US

PRESSURE (PSIA) (Note 2)

TEMPERATURE (°F)

Cp/Cv (K₁) OR (K_{avg})

COMPRESSIBILITY (Z₂) OR (Z_{avg})

GAS POWER REQUIRED (HP)

TRAIN (BHP) REQUIRED (Note 3)

BHP: REQUIRED AT DRIVER INCL. EXT. LOADED (GEAR ETC.) (Note 5)

(ESTIMATED) (Note 2)

	204.0477
	214.72
	1
	1.0016
	14280.6
	14392.6
	14392.6

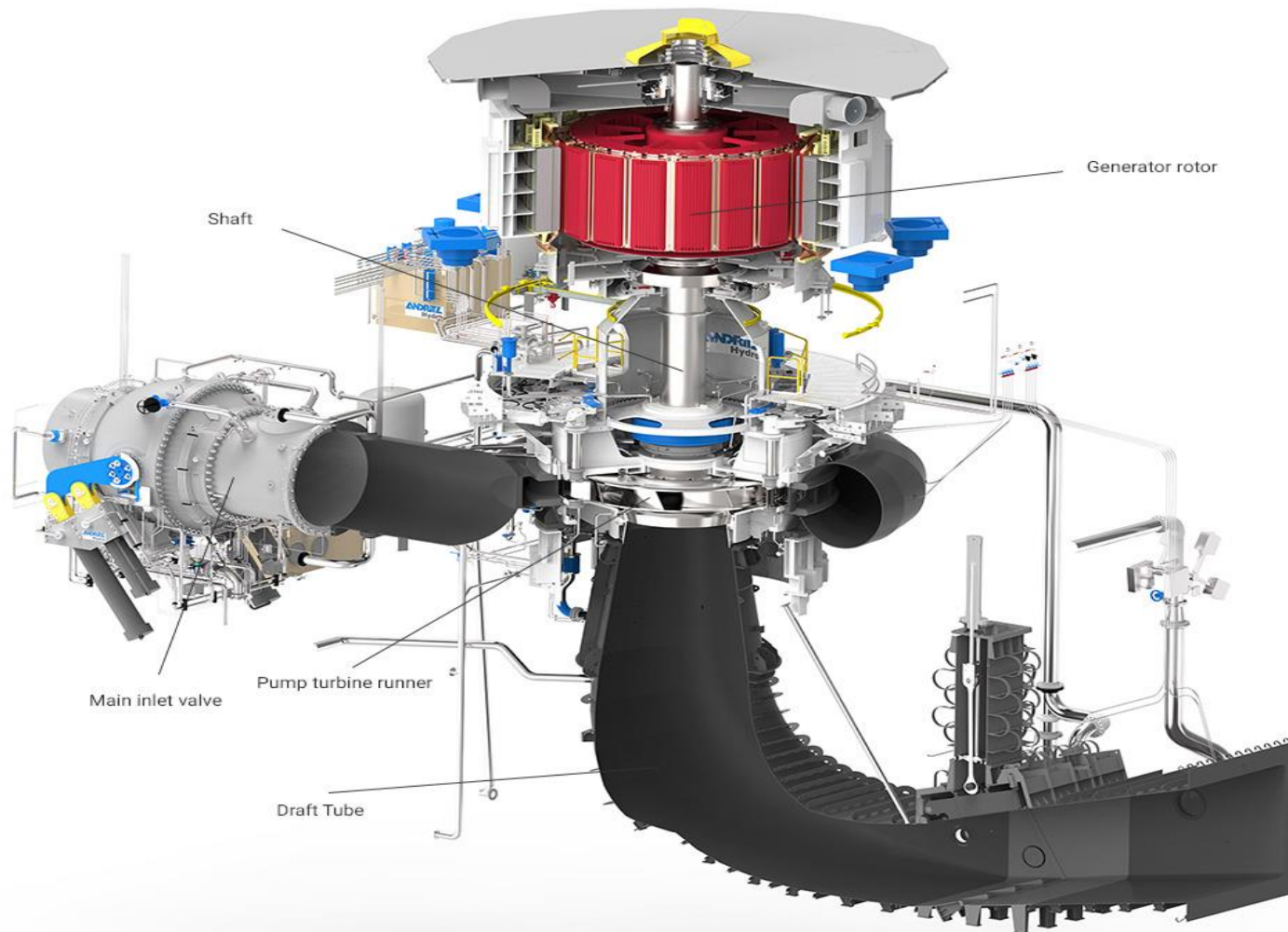
Break Horsepower Required at Full Load: 14,392.6 HP

Total Power Draw: 14,392.6 HP / .97 = 14,837.7 HP

(15,000 HP @ 1800 rpm synchronous motor nominal efficiency: 97%)

KW draw: 14,837.7 HP x .7457 KW per HP = 11,064.5 KW

33.8 m³/s give an output of 31 MW for the 100m tall plant



https://www.engineeringtoolbox.com/hydropower-d_1359.html

Online Hydro-power Calculator

The calculator below can be used to

www.engineeringtoolbox.com sier

Power (kW): 31682

1025 density (kg/m³)

0.93 efficiency

33.88 volume flow (m³/s)

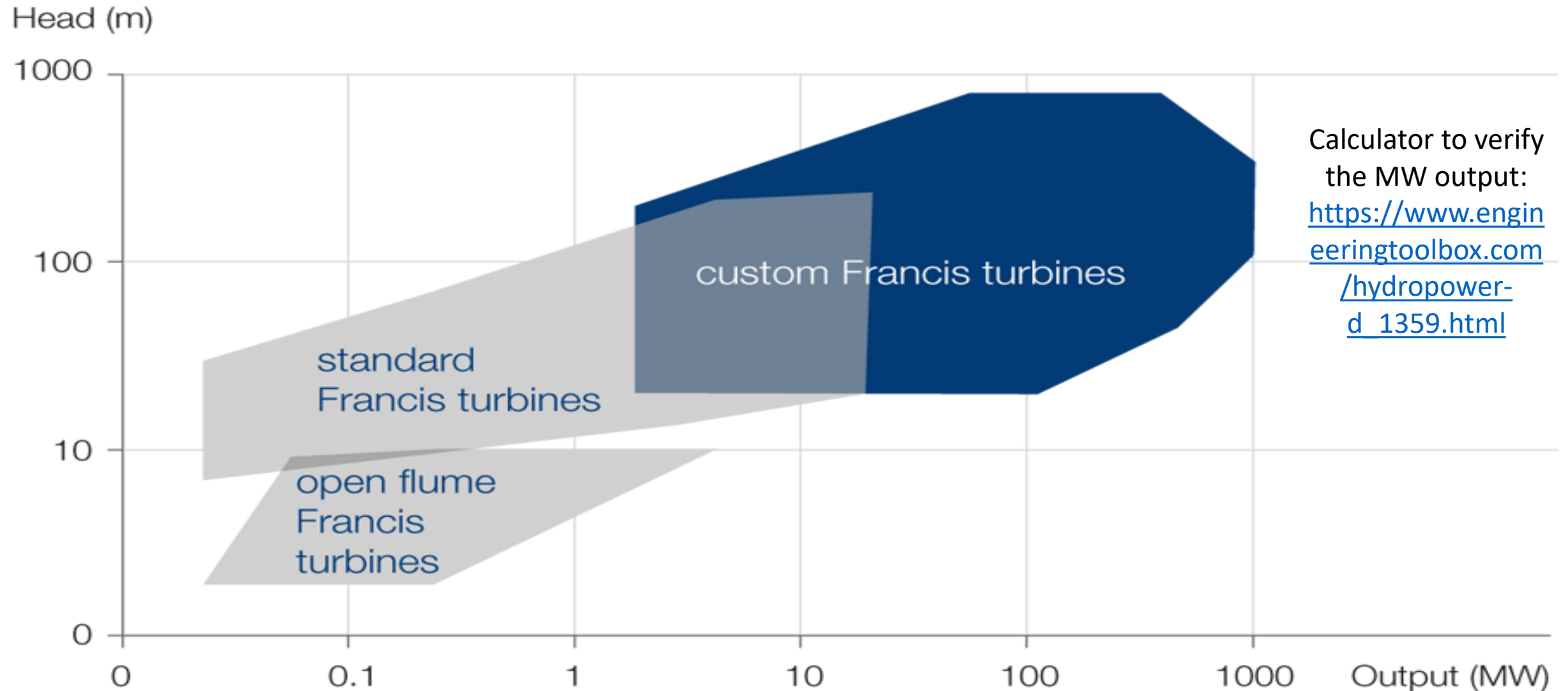
100 head (m)

Calculate!

Calculator to verify the MW output:

https://www.engineeringtoolbox.com/hydropower-d_1359.html

The MW output depend on the height of the structure



Feasibility Results 150m tall plants

Two Phase Flow Calculator Results			
Input Characteristics of System:			
Diameter of Bore Tube	D =	0.65	m
Mass Flux	G =	3561	kg/(m²·s)
Quality	x =	0.9	
Surface Tension	s =	73.5	mN/m
Roughness Factor	e =	0.000027432	m
Liquid Phase			
Inlet Temperature	T _{in} =	18	C
Outlet Temperature	T _{out} =	18	C
Mean Temperature	T _{mean} =	291.4833333	K
Liquid = Salt Water			
	k =	0.60	W/mK
	C _p =	4076.44	J/(kg·K)
	m =	0.000977	Pa·s
	r =	997.78	kg/m³
	Pr =	6.59	
Calculate Equivalent Reynolds Numbers:			
	Re _L =	2.37E+05	
	Re _G =	1.13E+08	
	Re _{L0} =	2.37E+06	
	Re _{G0} =	1.26E+08	
Calculate Equivalent Pressure Gradients:			
	-(dp _f /dz) _L =	1.51	Pa/m
	-(dp _f /dz) _G =	69543.93	Pa/m
	-(dp _f /dz) _{L0} =	112.60	Pa/m
	-(dp _f /dz) _{G0} =	85818.70	Pa/m
Calculate Two-Phase Frictional Pressure Gradients:			
Lockhart-Martinelli Correlation			
	C =	20	
	F _L =	50307.30	
	-(dp _f /dz) =	76029.32	Pa/m
Friedel Correlation			
	E =	617.339	
	F =	0.530	
	H =	215.89	
	r _{TP} =	1.30	kg/m³
	Fr =	1181237.90	
	We =	86432410.02	
	f _{L0} =	721.582	
	(dp _f /dz) =	81252.29	Pa/m
Chisholm Correlations			
	B =	0.32	
	n =	0.25	
	f _{L0} =	663.19	
	-(dp _f /dz) =	74677.19	Pa/m

Production Cue input sheet			
Pipe Size	25.59	In.	0.65 m
Venturi Size	15.75	in.	0.40 m
Pipe wall thickness	0.38	in.	0.95 cm
Submergence Depth	164.04	ft.	155.00 m
Pipe Length (lower)	164.04	ft.	150.00 m
Pipe Length (Mid)	492.13	ft.	1.00 m
Pipe Length (Upper)	656.17	ft.	150.00 m
Pipe Volume (lower)	571.31	ft.³	16177.61 L
Pipe Volume (Mid)	1709.07	ft.³	48395.28 L
Pipe Volume (Total)	2277.94	ft.³	64504.11 L
Density of Salt Water	1025.00	kg/m³	
Air mass flow	5508.88	scfm	2.60 m³/s
Air pressure input	17.50	bar	253.82 psig
Air Temp	77.00	F	
Air amount	55.12	kg/s	
Density of Air	21.20	kg/m³	
Time to fill per meter	0.0036	seconds	
Vacuum Pressure	227.70	psi	
Void Flow Rate	3143.62	l/s	
Piping volume per meter	0.59	Liters	
Velocity	24.76	m/s	
Water mass flow	3.067	m³/s	
Total flow	18.50	m³/s	
Total Pressure Drop	5.89	bar	
Total pressure output	2.96	bar	
Water production output	88524.55	l/s	
External Water entering the pipe	3143.62	kg/s	
kg water / kg air	57.03		
driving pressure	15.08		
breaking pressure	14.58		
if above 0, OK	0.50		
Estimated water output per pipe:	2.46	m³/s	
Estimated water output per pillars:	88.52	m³/s	

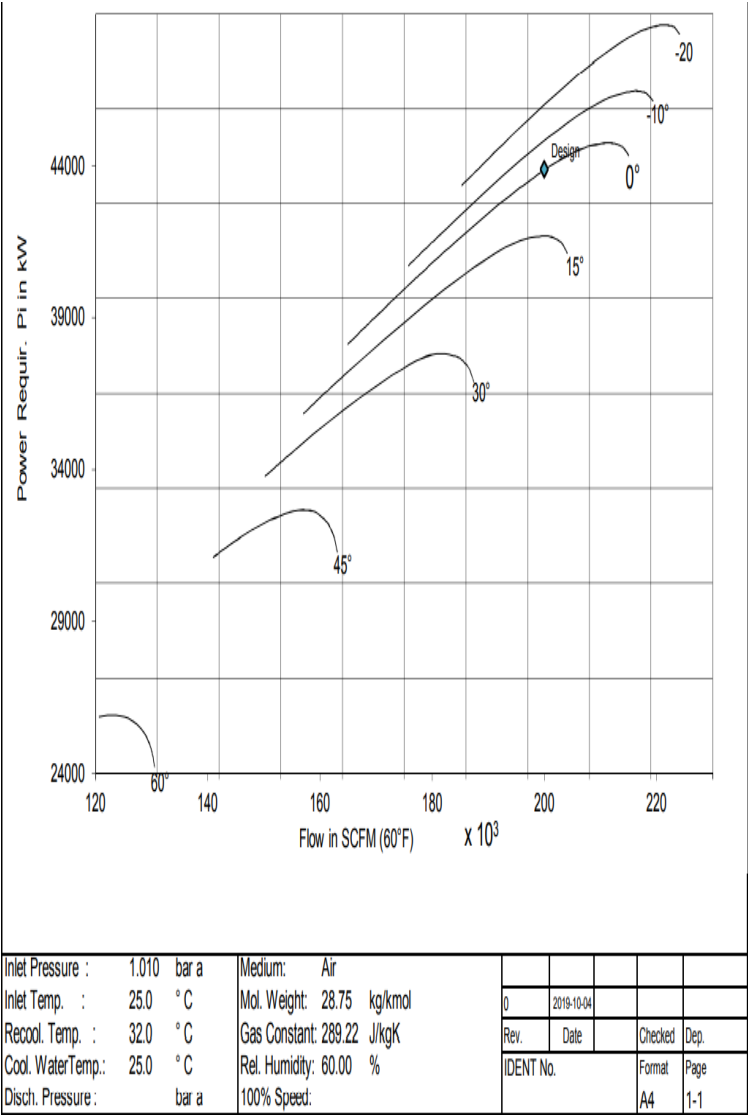
Note: The estimated water output per pipe above should be cross referenced with the chemeng software to ensure the accuracy

Instructions: All yellow cells are for inputting variables and if any cell illuminate red indicates production issue

Pipe Production		
Total Volume	2 459,02	Liters of H2O
Flow Rate	2,46	m³/s
Pipe Production	3,34	MW
Total Pillar Production		
Energy Balance Ratio:	3:1	
MW Production of (1) Pillar:	120	
MW Production of (3) Pillar:	361	
MW Production of (4) Pillar:	481	
Calculated on estimated water production $Ph(kW) = (q)(p)(g)(h)$		
Energy require		
3,479		kW
External Energy provided by sea		
6,14		kW
Energy Balance		
2,66		kW
MW production per pipe		
3,34		
MW Consumption		
1,19		
MW net production		
2,15		
Air production		
2,60		m³/s
55,12		l/s
1,19		MW Used
42,76		Enter MW Number in orange
External Force		
3143,62		available kg/s
3,14		m³/s
6,1		kW
11317,0		m³/h



The preferred pump for larger plants consume 42.8MW

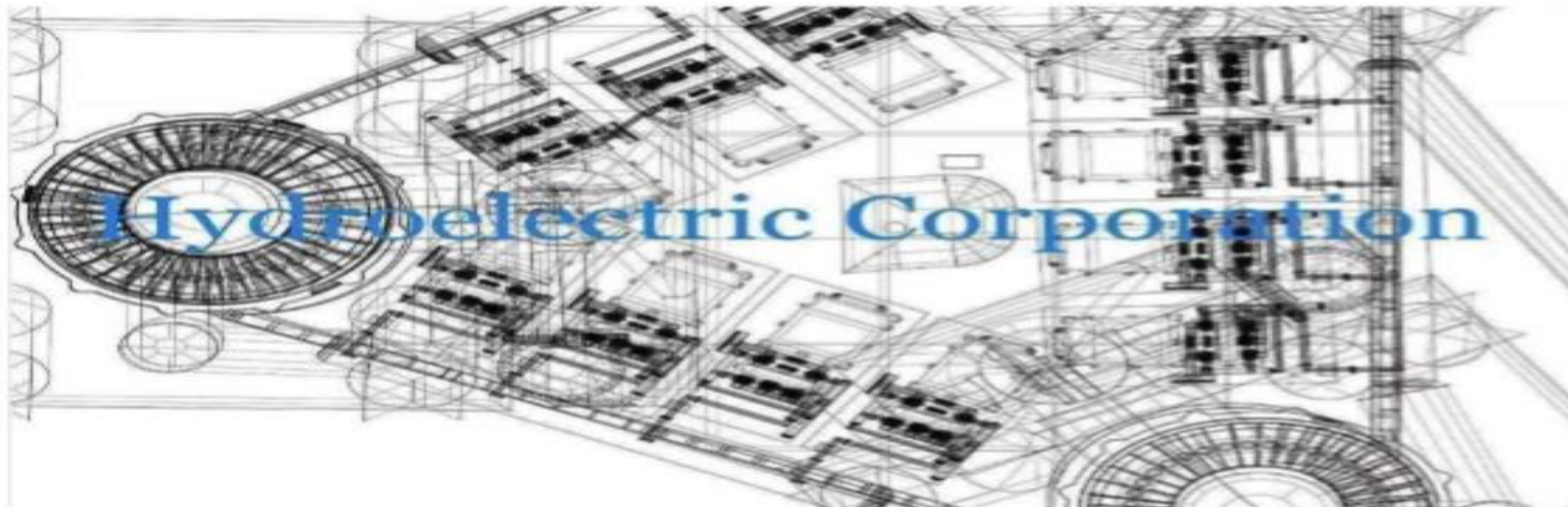


Verification by a 3rd party engineering firm

Technical Volume

(ALHP-190109)

Report that relates to an "air lift pump system" intended to generate hydroelectric power from ocean environments.





(12) PATENT

NORWAY

(19) NO

(51) Int Cl.

F03B 13/14 (2006.01)

(11) 344784

(13) B1

Norwegian Industrial Property Office

(21)	Application nr.	20190952	(86)	International Filing Date and Application Number	
(22)	Date of Filing	2019.08.04	(85)	Date of Entry into National Phase	
(24)	Date of Effect	2019.08.04	(30)	Priority	2018.10.04, US, 61,902
(41)	Publicly Available	2020.04.06			
(45)	Granted	2020.04.27			
(73)	Proprietor	HYDROELECTRIC CORPORATION, 18018 MOSS POINT DRIVE, 77379 SPRING, USA			
(72)	Inventor	Eiric Skaaren, Carl Kjelsens vei 17, 0860 OSLO, Norge			

(54)	Title	Hydroelectric Powerplant
(56)	References	
	Cited:	US 2012248776 A, CN 106014862 A, WO 2015070282 A, WO 2016055559 A
(57)	Abstract	

A system that produces electricity offshore through a fixed installation, including a minimum of; one turbine, one generator, one compressor set, one high voltage subseacable, and one control center; the generator is a gas driven generator that produces enough power to operate the electric motors, an onshore control center that operate and monitor the system, and all electricity generated through the water turbines and generators are transported to the onshore electricity grid through a high voltage subsea cable.



US 20200109693A1

(19) United States

(12) Patent Application Publication

Skaaren

(10) Pub. No.: US 2020/0109693 A1

(43) Pub. Date: Apr. 9, 2020

(54) OFFSHORE POWERPLANT THAT AIR UTILIZES PRESSURE BELOW THE SEASURFACE

F03B 17/06 (2006.01)

H02K 7/18 (2006.01)

(52) U.S. CL.

CPC F03B 13/10 (2013.01); H02K 7/1823 (2013.01); F03B 17/061 (2013.01); F03B 3/02 (2013.01)

(71) Applicant: Eiric Skaaren, Arlington, TX (US)

(72) Inventor: Eiric Skaaren, Arlington, TX (US)

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F03B 13/10 (2006.01)

F03B 3/02 (2006.01)

(57) ABSTRACT

A system that produces electricity offshore through a fixed installation, including a minimum of; one turbine, one generator, one compressor set, one high voltage subsea cable, and one control center; the generator is a gas driven generator that produces enough power to operate the electric motors, an onshore control center that operate and monitor the system, and all electricity generated through the water turbines and generators are transported to the onshore electricity grid through a high voltage subsea cable

Project Financials - \$ - Simplified					Pilot Metcentre Sale onshore Grid		Connecting to offshore wind substation Utsira		Connecting to offshore wind substation Spain		Powering oil & gas production offshore		New York Sale to onshore Grid		New York Sale to onshore Grid	
Net power generation hr					5 MW		20 MW		20 MW		10 MW		77 MW		309 MW	
Project years					5		20		20		10		20		20	
Capacity		MW Gross			7,3		31,7		31,7		16,1		120,0		480,0	
Operating Hrs pr yr		8 760			80 %		8 760		8 760		8 760		8 760		8 760	
Plant Availability pr yr							97 %		97 %		97 %		97 %		97 %	
Annual Production in		kWh			51 158 400		269 191 296		269 191 296		136 804 920		1 019 664 000		4 078 656 000	
Air compressor total MW consumption					2,5		10,8		10,8		5,3		42,8		171,2	
Air compressor MW consumption per pipe					0,83		0,83		0,83		0,89		1,19		1,19	
Annual KWh spent during pumping					17 520 000		91 769 760		91 769 760		45 358 054		363 680 160		1 454 720 640	
Capacity		MW net output			5		21		21		11		77		309	
Annual Production		kWh net output			33 638 400		177 421 536		177 421 536		91 446 866		655 983 840		2 623 935 360	
Flow per pipe		m3/s			2,60		2,60		2,60		2,60		2,60		2,60	
No pipes		3			3		13		13		6		36		144	
Total Plant flow		m3/s			7,80		33,80		33,80		15,60		93,60		374,40	
Power Price		per kWh			0,050		0,050		0,150		0,100		0,100		0,100	
Capacity Payment		\$ per MW year			36 500		36 500		36 500		36 500		36 500		36 500	
Maintenance (2%)		per kWh			-0,0095		-0,0035		-0,0035		-0,0049		-0,0044		-	
OPEX		\$ annual per MW			25 000		25 000		25 000		29 000		40 000		40 000	
Financials - annual																
Revenue power sales					1 681 920		8 871 077		26 613 230		9 144 687		65 598 384		262 393 536	
Revenue capacity & anchillary services							762 120		762 120				2 817 800		11 271 200	
Projected maintenance					-320 000		-620 000		-620 000		-450 000		-2 900 000		-8 980 000	
Site Lease pr yr					-100 000		-100 000		-100 000		-100 000		-1 000		-1 000	
OPEX					-120 000		-522 000		-522 000		-312 098		-3 088 000		-12 352 000	
EBITDA					1 141 920		8 391 197		26 133 350		8 282 589		62 427 184		252 331 736	
EBITDA MARGINS					68 %		95 %		98 %		91 %		95 %		96 %	

Project Financials - \$ - Simplified		Pilot Metcentre Sale onshore Grid 5 MW	Connecting to offshore wind substation Utsira 20 MW	Connecting to offshore wind substation Spain 20 MW	Powering oil & gas production offshore 10 MW	New York Sale to onshore Grid 77 MW	New York Sale to onshore Grid 309 MW
Net power generation hr							
Capex \$ per MW		3 333 333	1 484 674	1 484 674	2 090 689	1 878 238	1 454 016
Total cost \$/MWh (~ simplified LCOE)		16	18	18	32	27	22
- Purchase of Plant equipment		6 000 000	20 000 000	20 000 000	12 000 000	60 000 000	226 000 000
- Second hand jackup rig		7 000 000	7 000 000	7 000 000	7 000 000	40 000 000	93 000 000
- Electrical subsea cable		1 000 000	1 000 000	1 000 000	1 000 000	10 000 000	25 000 000
- Installation		500 000	500 000	500 000	500 000	10 000 000	50 000 000
- Construction yard costs (EPC) - other		1 500 000	2 500 000	2 500 000	2 000 000	25 000 000	55 000 000
Capex		16 000 000	31 000 000	31 000 000	22 500 000	145 000 000	449 000 000
Loan		-	18 600 000	18 600 000	13 500 000	116 000 000	359 200 000
Grant		4 800 000	-	-	-	-	-
Equity		11 200 000	12 400 000	12 400 000	9 000 000	29 000 000	89 800 000
Grant %		30 %	0 %	0 %	0 %	0 %	0 %
Equity ratio		70 %	40 %	40 %	40 %	20 %	20 %
RoA (Ebitda/Capex) - simplified		7 %	27 %	84 %	37 %	43 %	56 %
RoE (Net cash/Equity) - simplified		10 %	52 %	195 %	69 %	176 %	241 %
Payback yrs (simple)		14,0	3,7	1,2	2,7	2,3	1,8
Loan Interest		7,0 %	7,0 %	7,0 %	7,0 %	7,0 %	7,0 %
Residual value yr 20(10%)		-	3 100 000	3 100 000	2 250 000	14 500 000	44 900 000
Residual %		0 %	10 %	10 %	10 %	10 %	10 %
Input figures (red)							

Different profit models for a upgraded Jackup

1

Carbon Tax Relief

With the ever increasing carbon tax in Europe and U.S. a offshore production facility that release close to 500 000 ton a yr, would save \$68 500 a day with a carbon tax at \$50/ton, by leasing a jack-up rig that provides clean and reliable power. With a **day rate at \$70 000**, the yearly earnings would be close to **\$25 m.**

2

Electrifying offshore assets

Norway has indicated a carbon tax at \$100 per ton by 2025, and oil & gas producers, such as Equinor, spend more than a billion USD to make the Troll field electric. Offshore hydrogen plants will also be in high demand of power, and a **day rate at \$140 000** represent revenue of **\$50 million** a yr. (\$1bn 20 yrs).

3

Electricity Sales to Grid

Hydroelectric Corporation has entered into two PPA's with Con Edison, which is a utility major supplying more than 10 million US consumers. With the spot prices in New York, the net profit by connecting to the PJM/NY grid is estimated to be **\$10m - \$16m** for a 20 MW plant. The EBITDA for a 77 MW plant is **\$62 m.**

4

Balancing power to offshore wind

Offshore wind players are exposed to \$4000/MWh* under baseload terms, meaning that the jack-ups could be positioned as "stand by" and replace "backup power" from coal plants and nuclear. By offering reserve capacity at \$400/MWh for a 20MW plant the annual revenue would be about **\$70 m.**

* <https://on.ft.com/39ZRIYh>

Hydroelectric Corp will follow the megatrend of H₂

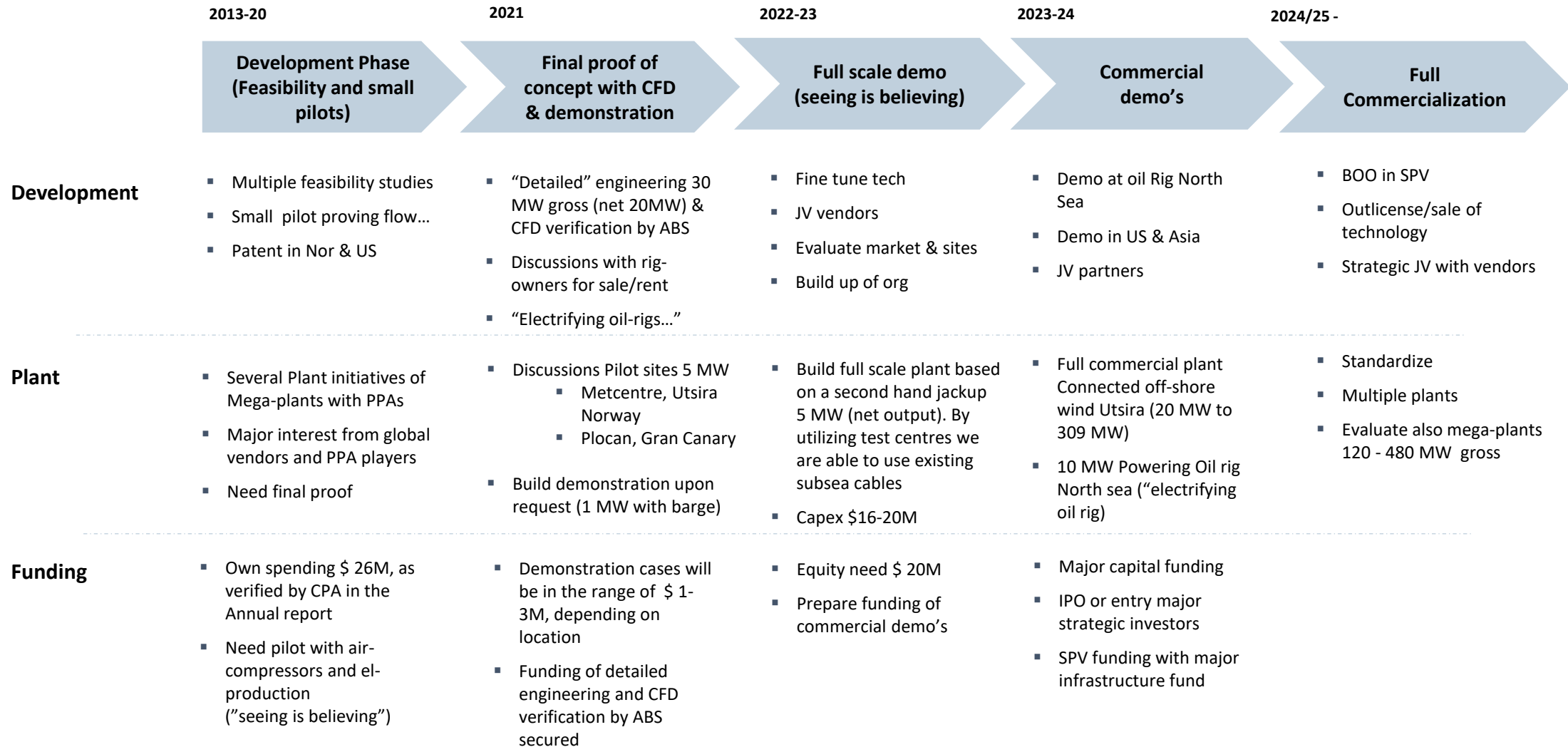


A carbon tax at \$50/ton CO₂, would add \$900 per ton to the cost of 1 ton ammonia.

This again provides a massive incentive to produce ammonia from renewable energy, in particular pumped hydro which are able to supply baseload power 24/7.

Source: <https://arpa-e.energy.gov/sites/default/files/1%20Hydrofuel%20-%20UOIT%20Presentation%20for%20ARPA-E%20Aug.%2017-18%2C%202017%20FINAL.pdf>

Hydroelectric Offshore Pumped Hydro - Road map



From: Dawn Ortiz-Legg <dortizlegg@co.slo.ca.us>
Sent: Thursday, October 21, 2021 7:07 AM
To: CSLC CommissionMeetings
Subject: 10/21/21 - ITEM 32 OSW CALDEMO

Attention: This email originated from outside of SLC and should be treated with extra caution.

Honorable California Land Commissioners:

As District 3 San Luis Obispo County Supervisor, covering the coastal region just north of Vandenberg, I send my encouragement and support for your authorization to initiate the process to begin review of the off shore wind process on Item 32.

Item 32 is an extension of California State AB 32, the landmark climate change bill recognizing the need and urgency of development renewable carbon free energy. Your steps today will enable our state to join the forwarding thinking countries and states to develop the Off Shore Wind Industry in California, bringing clean energy, job opportunities and new understanding of our precious Pacific Ocean resource.

In my recent career, I was one of many individuals who benefitted from AB32, developing utility scale plants in central California from 2010-2018, that now generate enough energy to power 500,000 average California homes. It was done with intense scrutiny and oversight and in balance with all the resources. The public trust, in the facilities which I was engaged, was garnered by this process.

Today's hearing to initiate the monitoring process allows California to once again demonstrate that clean power can be generated in collaboration with environment, fisheries and stakeholders interests addressed. No other state takes the necessary steps to identify impacts, collaborate solutions and mitigate to remedy like California. However, time is of essence.

As energy generation drives the national security and safety every day of California citizens, there are always impacts, no matter what form of generation. Here, the CA Lands Commission has the noble responsibility to help us – our valued citizens, resources, and industries – identify the conditions to which we can most efficiently and effectively balance these energy needs while meeting conditions to address impacts.

San Luis Obispo County has contributed significantly to California's energy generation portfolio, and has done it responsibly, safely and economically. Many in our county are on standby to help build this new industry and clean energy opportunity and I strongly encourage the move forward on Item 32 today.

Thank you for your efforts today.

Sincerely,
Dawn Ortiz-Legg

Supervisor Dawn Ortiz-Legg
District 3
County of San Luis Obispo
Board of Supervisors

(p) 805-781-4336



Alliance of Communities for Sustainable Fisheries
256 Figueroa Street #1, Monterey, CA 93940
(831) 239-1219
www.alliancefisheries.org

Eleni Kounalakis, Chair

October 21, 2021

California State Lands Commission

Dear Chair Kouralakis and Commissioners,

Thank you for the opportunity to comment on the State Land Commission's (SLC) pending decision on advancing the CIERCO and IDEOL offshore wind (OSW) "demonstration" projects ("Projects") to a more robust environmental review.

The Alliance of Communities for Sustainable Fisheries (ACSF) is a non-profit organization of the leaders of the fishing industry in six Central California ports, including Morro Bay and Port San Luis, the two harbors closest to the two proposed projects. The ACSF has commented to the SLC twice previously regarding our reasons to believe that advancing the Projects is not in the best interest of the State.

The three main reasons for our opposition are 1) the proposals as thus described are very weak as "pilot" or "demonstration" projects, and 2) the Projects will further remove valuable, productive fishing grounds, in addition to the State's Marine Protected Areas in the area and other mandated closures, and 3) the cumulative effects of these Projects in addition to the very likely large offshore wind projects in federal waters will be devastating to the region's commercial fishermen and to our communities.

The ACSF urges the SLC to not advance these projects in any way.

In the event that the SLC decides to advance one or both of the Projects to a full environmental review, we ask the Commission to consider these recommendations:

- Require the Project proponents to provide more information about the science-based studies they will perform that will inform the SLC and public that this new information is relevant to the larger, deeper, OSW projects that are likely to occur in federal waters. The SLC should not hesitate to tell the developer what science products are required.
- Require a cumulative effects analysis (environmental and socioeconomic) of the impact of the Projects when combined with the anticipated multiple OSW projects in federal waters.
- Limit advanced environmental review to only one project.

- Require the Project developers to enter into a compensatory-mitigation agreement with the several commercial fishing associations most immediately affected by their developments.

Thank you for considering the recommendations of the Alliance of Communities for Sustainable Fisheries.

A handwritten signature in blue ink, appearing to read "Alan Alward".

Alan Alward,

Co-Chair

ACSF



National Audubon Society

4700 Griffin Ave
Los Angeles, CA 90031

323.697.1126

www.audubon.org/cleanenergy

October 19, 2021

Ms. Eleni Kounalakis, Chair
California State Lands Commission
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

Via Email: CSLC.Commissionmeetings@slc.ca.gov

RE: Preliminary Environmental Assessment for Vandenberg Offshore Wind Energy Projects; Proposal to Prepare an Environmental Impact Report—Agenda Item 32

Dear Chair Kounalakis and Commissioners:

The Clean Energy Initiative at National Audubon Society works with 27 regional Audubon programs across the United States, including Audubon California, to facilitate and support the rapid development of well-sited and operated wind, solar, geothermal, storage, and transmission projects to achieve 100% clean energy and net zero emissions as soon as possible.

We want to provide our national perspective on siting and approving offshore wind demonstration projects from other states.

In our experience, other projects proposed in state waters and/or as demonstration projects have set a precedent for state government agencies approving similar projects. The projects that have been successful have taken great care to consider avian and environmental impacts in their siting and decision-making—those which have failed to do so have been rejected by state agencies.

We provide the histories and lessons learned from projects approved by other state government agencies to lend support for Commissioners to reject the Vandenberg Offshore Wind Projects **less than 3 miles from the coast** as not in the interests of the State of California and, therefore, decide NOT to proceed to CEQA analysis.

Maine

HISTORY

The Governor of Maine recently signed legislation to authorize the planning of an offshore floating wind demonstration project titled Aqua Ventus of a single 11MW turbine **12 miles from the coast** to test floating wind and associated technologies.

In January Gov. Mills called for a ten-year **moratorium on new offshore wind proposals in state waters** to give proper consideration to concerns regarding the environment, fisheries, and other

marine users before proceeding with offshore wind in Maine.¹ The state is currently developing its Offshore Wind Roadmap in consultation with an expert advisory committee, working groups, and broad public input.²

Gov. Mills recently applied for a research array in federal waters in the Gulf of Maine, after an extensive public outreach process led by the Governor's Energy Office, paired with an analysis by the Maine Department of Marine Resources, to identify a least conflict site.³

LESSONS LEARNED

The proposed Vandenberg projects are not necessary, nor are they intended, to test offshore wind technology. We know well enough the potential impacts from offshore wind development to know that we should site projects in least conflict areas and far from avian nesting habitat.⁴

Demonstration projects could qualify under BOEM and a potential grant from DOE and be relevant to California's development of offshore wind if they were in federal waters where other states have chosen to site their demonstration projects.

Rhode Island

HISTORY

Block Island demonstration offshore wind project of five 6MW turbines **8 miles from the coast** (and 3.8 miles from an island) was approved following the Rhode Island Ocean Special Area Management Plan⁵ that funded studies to characterize avian hotspots in Rhode Island waters.⁶ The project was supported by environmental groups.

LESSONS LEARNED

Stakeholder-driven spatial planning processes increase stakeholder buy-in and reduce project opposition by increasing transparency and public trust in the decision.

New Jersey

HISTORY

In December 2018, New Jersey Board of Public Utilities **rejected** an offshore wind project **2.8 miles from the coast** due to concerns of costs for ratepayers as well as impacts to wildlife.

The state Department of Environmental Protection has conducted extensive studies on how birds and marine wildlife would be impacted by offshore wind farms, and essentially found the potential harm to wildlife is minimized the farther the turbines are located offshore.⁷

¹ <https://www.southcoasttoday.com/story/news/environment/2021/01/26/maine-governor-pausing-offshore-wind-while-consulting-fishermen/4258795001/>

² <https://www.maineoffshorewind.org/road-map/>

³ <https://www.maine.gov/energy/initiatives/offshorewind/researcharray>

⁴ See examples: Everaert J, Stienen EWM. 2007. Impact of wind turbines on birds in Zeebrugge (Belgium): Significant effect on breeding tern colony due to collisions. *Biodiversity and Conservation* 16:3345–3359; Lange CJ, Ballard BM, Collins DP. 2018. Impacts of wind turbines on redheads in the Laguna Madre. *The Journal of Wildlife Management* 82:531–537.

⁵ <https://seagrant.gso.uri.edu/oceansamp/>

⁶ Winiarski KJ, Miller DL, Paton PWC, McWilliams SR. 2014. A spatial conservation prioritization approach for protecting marine birds given proposed offshore wind energy development. *Biological Conservation* 169:79–88.

⁷ <https://www.njspotlight.com/2018/12/18-12-18-state-rejects-atlantic-city-offshore-wind-project-for-third-time-too-pricey/>

LESSONS LEARNED

The state is obligated to deny a project in which the potential harm caused by the project is likely to outweigh any potential benefits.

Virginia

HISTORY

In June 2019, BOEM approved a 2 6MW turbine research project by Dominion Energy, **27-miles from the coast** of Virginia and adjacent to Dominion Energy's commercial lease project, following extensive review.⁸

LESSONS LEARNED

Projects intended to research technology needs and environmental impacts should be sited near proposed commercial scale projects in order to be valuable.

Ohio

HISTORY

Ohio Power Siting Board approved a permit for the Icebreaker offshore wind demonstration project of six 3.45MW turbines in Lake Erie **8 to 10 miles offshore** of Cleveland with 33 conditions:

Among these conditions, Icebreaker Wind must conduct radar studies and based on these studies, provide the OPSB with a bird and bat impact mitigation plan, including a collision monitoring plan. Until additional information is provided to the Board and the Board finds otherwise, Icebreaker Wind must completely feather turbines (stopping them from rotating) during nighttime hours from March 1 through November 1 as an initial bird and bat risk mitigation measure.

LESSONS LEARNED

The state is responsible for implementing strict monitoring, minimization, and mitigation requirements for impacts that cannot be entirely avoided through least conflict siting.

--

Audubon thanks you for your attention to this additional information on demonstration project processes and permitting by other states in consideration of your decision.

Sincerely,

Garry George
Director, Clean Energy Initiative
Garry.george@audubon.org

⁸ <https://www.boem.gov/renewable-energy/state-activities/coastal-virginia-offshore-wind-project-cvow>



October 18, 2021

Ms. Eleni Kounalakis, Chair
 California State Lands Commission
 100 Howe Avenue, Suite 100-South
 Sacramento, CA 95825-8202
Via Email: CSLC.Commissionmeetings@slc.ca.gov

RE: Preliminary Environmental Assessment for Vandenberg Offshore Wind Energy Projects; Proposal to Prepare an Environmental Impact Report – Agenda Item 32

Dear Chair Kounalakis and Commissioners,

The following comments are submitted on behalf of the Environmental Defense Center, Natural Resources Defense Council, National Audubon Society, Center for Biological Diversity, Monterey Bay Aquarium, Surfrider Foundation, Sierra Club California, Defenders of Wildlife, American Bird Conservancy, California Coastal Protection Network, Ocean Conservation Research, Santa Barbara Audubon Society, Ventura Audubon Society, and Gaviota Coast Conservancy in response to the California State Lands Commission's ("CSLC") Final Preliminary Environmental Assessment ("PEA") for the two Vandenberg Offshore Wind Energy Projects ("Vandenberg Projects" or "Projects") proposed in State waters along the Santa Barbara County coastline, and to the proposal to solicit Statements of Interest for consultant services to prepare an Environmental Impact Report ("EIR").

Together, our organizations have long advocated for policies and actions to bring renewable energy, including floating offshore wind projects, to scale in an environmentally protective manner. We understand that developing renewable energy is pivotal for California to

avoid the worst consequences of climate change, achieve a zero-carbon energy future, and maintain our thriving economy, healthy communities, and national role as an environmental leader.¹ Careful consideration of *how* we achieve this zero-carbon future is vital for protecting California's internationally treasured wildlife, landscapes, marine ecosystems, cultural resources, productive farmlands, and diverse habitats.

As it explores prospective offshore wind development, California has an opportunity and responsibility to become a visionary leader in offshore wind energy and create a planning process that sets a high environmental standard for this new technology and ocean use. Our organizations have long advocated for the State to first identify environmentally responsible locations to help ensure offshore wind projects, and the industry, advance smoothly, without significant delay because of siting conflicts. Recently signed into law, AB 525 supports this effort and emphasizes the following:

*Offshore wind should be developed in a manner that protects coastal and marine ecosystems. The State of California should use its authority under state programs and policies to ensure (1) avoidance, minimization, and mitigation of significant adverse impacts, and (2) monitoring and adaptive management for offshore wind projects and their associated infrastructure.*²

As explained herein, the proposed Projects are inconsistent with AB 525 because they would cause significant adverse impacts to sensitive coastal and marine ecosystems.

We appreciate that the CSLC prepared the PEA to gather early information regarding the potential impacts of the Vandenberg Projects. As such, the CSLC is in the unusual position of having a lot of information already, based on the Final PEA and comments. We believe that this information clearly demonstrates that the Projects are not in the best interests of the State and are inconsistent with the CSLC's obligation to protect public trust resources. Preparing an EIR is not necessary given the ample information presented to the CSLC regarding the environmental harms posed by these Projects. Therefore, we urge the CSLC to deny the applications because the Projects are not in the best interests of the State.

I. The CSLC may not Issue a Lease for a Project that is not in the Best Interests of the State.

Although the CSLC has discretion when it comes to leasing decisions (see, for example Public Resources Code sections 6301 and 6501.1³), such discretion is subject to the requirement "that it be exercised in the best interests of the State." Pub. Res. Code § 6005.

¹ For example, Audubon's scientists found that climate change may drive 389 species of North American birds to extinction if we cannot limit warming below 3 degrees Celsius. Chad B. Wilsey et al., *Survival by Degrees: 389 Bird Species on the Brink*, AUDUBON (2019), available at <https://www.audubon.org/climate/survivalbydegrees>. Also see: Trainer, V.L., Kudela, R.M., Hunter, M.V., Adams, N.G. and McCabe, R.M., 2020. Climate extreme seeds a new domoic acid hotspot on the US west coast. *Frontiers in Climate*, 2, p.23.

² AB 525, Section 1(m). Chaptered September 23, 2021.

³ Public Resources Code section 6301 states, "The commission may lease or otherwise dispose of such lands, as provided by law, upon such terms and for such consideration, if any, as are determined by it." Section 6501.1

This obligation is closely related to the CSLC's responsibility to protect public trust resources. See Pub. Res. Code § 6009(c) (state tidelands "remain subject to the public trust, and remain subject to the oversight authority of the state by and through the State Lands Commission."). In *Marks v. Whitney* (1971) 6 Cal.3d 251, 259-260, the California Supreme Court held that "one of the most important public uses of the tidelands—a use encompassed within the tidelands trust—is the preservation of those lands in their natural state, so that they may serve as ecological units for scientific study, as open space, and as environments which provide food and habitat for birds and marine life, and which favorably affect the scenery and climate of the area." The same Court held in *National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419, 441, that "the public trust doctrine is more than an affirmation of state power to use public property for public purposes. It is an affirmation of the duty of the state to protect the people's common heritage of streams, lakes, marshlands and tidelands, surrendering that right of protection only in rare cases when the abandonment of that right is consistent with the purposes of the trust."

With respect to CSLC leasing decisions, the court in *W. Oil & Gas Assn. v. State Lands Com.* (1980)105 Cal. App. 3d 554, 559, noted that "considerations affecting the [CSLC's] decision are whether the land to be leased is *environmentally significant, the extent of potential damage to it*, whether the rental rate will result in the use of substitute facilities by a prospective lessee, and the availability, reliability, and applicability of comparable or related data concerning the land's value." (Emphasis added.) In considering a lease for commercial or industrial development on state tidelands, "the decision is discretionary and dependent upon an assessment of the public interest." *Id.*, citing *Higgins v. City of Santa Monica* (1964) 62 Cal.2d 24.

Accordingly, the CSLC's leasing decisions are bound by its responsibilities to act in the best interests of the State and protect the State's public trust resources.

II. The Proposed Projects are not in the Best Interests of the State and would Imperil Public Trust Resources.

The proposed Projects are not in the best interests of the State because they would harm public trust resources and adversely affect the important ecology and environment of State tidelands. As described in the PEA, the Projects are:

1. Near a part of the coast and nearshore waters included in the CSLC's Significant Lands Inventory (which is described as "a 1-mile strip of tidelands and submerged land in the Pacific Ocean immediately offshore of VSFB"). This area was included in the Inventory in part because of the presence of California brown pelican, California least tern, and large numbers of shorebirds. These birds extend beyond that 1-mile mark offshore into the Project area. (PEA at 4-11)

enumerates that the lease of state land is purely optional and within the discretion of the commission, providing that "[l]ands owned by the state, and which are under the jurisdiction of the commission may be leased for such purpose or purposes as the commission deems advisable..."

2. Within an area of strong seasonal upwelling and high primary production—conditions that support “abundant and diverse habitats.” (PEA at 4-11)
3. Directly adjacent to the Vandenberg State Marine Reserve (“VSMR”) (PEA at 4-12), which has the highest level of protection in California’s Marine Protected Area (“MPA”) network.
4. Home to multiple species of concern and those protected under both Federal and State regulations, including: “Federal and State Endangered Species Acts (ESAs); the Marine Mammal Protection Act (MMPA); Migratory Birds Act; Magnuson-Stevens Fishery Conservation and Management Act; the California Department of Fish and Wildlife (CDFW) Fish and Game Codes; the National Oceanic and Atmospheric Administration (NOAA) species of concern lists; the U.S. Fish and Wildlife Service (USFWS) regulations; and the California Coastal Commission (CCC) that designate species as having a scientific, recreational, ecological, or commercial importance under the Coastal Act.” (PEA at 4-13; Migratory Bird Treaty Act misnamed as “Migratory Birds Act”)
5. Proposed in an area supporting approximately forty species of marine mammals (PEA at 4-13); at least five species of sea turtles (PEA at 4-18); endangered black and white abalone (PEA at 4-18); many commercially, recreationally, and ecologically important species of fishes (PEA at 4-19), including special status fish species (PEA at 4-20); numerous species of marine birds (at least fifty-four) and bats (PEA at 4-21), some of special status with potential occurrence in the Project areas. (PEA at 4-23)
6. Along the Pacific Flyway migration route. (PEA at 4-22)
7. Near largely undeveloped open space with intact Central Coast scrub, maritime scrub, coastal bluff, dune scrub, floodplains, wetlands, riparian, and littoral habitats (PEA at 4-38) that support myriad species, including special status invertebrates, fish, amphibians, reptiles, and birds. (PEA Table 4-12)
8. Described by NOAA as an ecological hotspot. (PEA at 4-24)
9. Overlap or border leatherback turtle critical habitat, humpback whale critical habitat, and biologically important areas for gray and blue whales. (PEA at 2-24)

The attached September 13, 2021, comment letter on the Draft PEA further describes potential impacts of these Projects.⁴ In our letter we describe the Projects’ impacts to sensitive marine and terrestrial species and habitats, including important habitat for birds, whales, sea turtles, the southern sea otter, bats, fisheries, and other marine mammals.

⁴ See attached letter from environmental organizations to Eric Gillies, CSLC, regarding Comments on Draft Preliminary Environmental Assessment for Vandenberg Offshore Wind Energy Projects (September 13, 2021).

Comments by the California Coastal Commission similarly point out that “marine mammals and seabirds are generally found in higher densities closer to the shoreline” and that the Commission “support[s] alternatives that consider turbines sited further offshore.”⁵ The Commission noted impacts to marine resources, scenic and visual resources, commercial and recreational fishing, and navigation.⁶ For this reason, the Commission prefers “alternative locations for these projects in areas with lower marine mammal and seabird density, particularly areas further from the coast, to better avoid and minimize environmental impacts.”⁷

III. The Projects must be Denied.

It is because of these impacts that we respectfully request the CSLC find that moving forward with environmental review for offshore wind in this location is not in the best interest of the State. We do not take this position lightly, as our organizations and the greater environmental community have overwhelmingly supported offshore wind projects on both West and East Coasts that are further along in leasing and development. Projects that have been supported by the environmental community included more transparent, inclusive, and informed stakeholder engagement to arrive at siting decisions, such as Block Island and the Maine research array⁸.

A similar years-long process undertaken by the Bureau of Ocean Energy Management (“BOEM”) and California Energy Commission (“CEC”), along with the wind industry and stakeholders, resulted in the identification of two Call Areas for wind offshore California: Morro Bay and Humboldt. The proponents of the two Vandenberg Projects failed to meaningfully engage with stakeholders early in the process to identify more acceptable locations for a true pilot project. Such engagement would have resulted in a better outcome, informed by input and data accumulated by NGOs, scientists, other stakeholders, and resource agencies. Unfortunately, the location the developers decided to pursue is among the most problematic in terms of environmental impacts along the entire California Coast.

That the Vandenberg Projects are called “demonstration” projects does not change the fact that inclusive and science-driven planning should precede any site-specific project analysis. The Projects are not appropriately sited and have the potential to result in significant impacts to wildlife as a result of their locations. In addition, the Projects would do little to inform projects in more appropriate locations, as they are not proposed in relevant locations or at scale commensurate with projects under consideration in federal waters offshore California. As noted by the California Coastal Commission, data collected in the area of the proposed Projects may not be transferable to projects in federal waters.⁹

⁵ Letter to CSLC from Kate Huckelbridge, California Coastal Commission (September 13, 2021) (“Coastal Commission Letter”), p. 2.

⁶ *Id.* at pp. 3-4.

⁷ *Id.* at p. 2.

⁸ <https://www.maine.gov/energy/initiatives/offshorewind/researcharray>

⁹ Coastal Commission Letter, pp. 4-5.

IV. Conclusion

We recognize that wind energy is an important facet to our ability to tackle climate change. That is why it is so important that the initial rollout of offshore wind energy on the West Coast be smooth and successful. There are many promising projects being developed now, but these two applications fall short in scope and would have a dire environmental impact on globally significant coastal and marine ecosystems. These Projects are not in the best interest of the State, threaten important public trust resources, and would establish an adverse precedent for this nascent industry.

We respectfully urge the CSLC to deny these applications and work with other State and Federal agencies, stakeholders, and the wind industry to follow the mandates of AB 525 and support siting of offshore wind projects that protect coastal and marine ecosystems and avoid or minimize significant adverse impacts. We believe that pursuit of wind energy projects at more appropriate locations will be more effective and successful at helping the State meet its renewable energy goals.

We do not need an EIR to tell us that these Projects will have significant adverse impacts on the State's coastal and marine environment. Fortunately, we already have a lot of information about this region and the impacts that would result from these Projects. Therefore, we urge the CSLC to deny these applications and instead support existing efforts to appropriately site and design wind energy projects offshore California.

Thank you for your consideration.

Kristen Hislop, Senior Director, Marine Program
Environmental Defense Center

Sandy Aylesworth, Senior Advocate
Natural Resources Defense Council

Garry George, Director, Clean Energy Initiative
National Audubon Society

Lauren Cullum, Policy Advocate
Sierra Club California

Lisa Belenky, Senior Attorney
Center for Biological Diversity

Pamela Flick, California Program Director
Defenders of Wildlife

Amy Wolfrum, California Ocean Conservation Manager
Monterey Bay Aquarium
(cont'd)

Joel Merriman, Director, Bird-Smart Wind Energy Campaign
American Bird Conservancy

Michael Stocker, Director
Ocean Conservation Research

Katherine Emery, Executive Director
Santa Barbara Audubon Society

Susan Jordan, Executive Director
California Coastal Protection Network

Delia Bense-Kang, Northern and Southern CA Regional Coordinator
Surfrider Foundation

Bruce Schoppe, Conservation Chair
Ventura Audubon Society

Doug Kern, Executive Director
Gaviota Coast Conservancy

Attachment: Letter from environmental organizations to Eric Gillies, CSLC, regarding
Comments on Draft Preliminary Environmental Assessment for Vandenberg Offshore
Wind Energy Projects (September 13, 2021).



September 13, 2021

California State Lands Commission
Attn: Eric Gillies
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

Via Email: stateapplications.OSW@slc.ca.gov

RE: Comments on Draft Preliminary Environmental Assessment for Vandenberg Offshore Wind Energy Projects

Dear Mr. Gillies,

The following comments are submitted on behalf of Environmental Defense Center, Sierra Club California, Ocean Conservation Research, Defenders of Wildlife, American Bird Conservancy, National Audubon Society, Center for Biological Diversity, Natural Resources Defense Council, Surfrider Foundation, Monterey Bay Aquarium, Santa Barbara Audubon Society, Ventura Audubon Society, and Gaviota Coast Conservancy in response to the California State Lands Commission's (CSLC) Draft Preliminary Environmental Assessment (DPEA) for the two Vandenberg Offshore Wind Energy Projects (Vandenberg Projects or Projects) proposed in state waters along the Santa Barbara County coastline.

As you know from a letter that several of our organizations submitted on March 31, 2021 (see Attachment A) in response to the CSLC's request for input in advance of the DPEA, we oppose the locations of these Projects; review of the DPEA has only reinforced our concerns. Moving forward with these Project applications is not in the best interest of the State of California or the offshore wind energy industry. Our organizations remain united in support of responsibly sited, constructed, and operated floating offshore wind power. We do not take a

position to oppose these projects lightly, but we feel that it is necessary for the protection of wildlife and the furtherance of responsibly sited, successful offshore wind projects in California.

On behalf of our organizations and our millions of members, we reiterate previous requests regarding our vision for the state's offshore wind strategy:

1. Avoid sensitive marine habitats and protected areas.
2. Ensure a robust stakeholder planning process.
3. Devote time and resources to utilizing the California Offshore Wind Data Basin Gateway.
4. Include a structure and plan to incorporate future scientific studies and data into project siting.

After review of the DPEA, we remain concerned with the Projects' proposed locations, as we believe they do not avoid sensitive marine habitats and protected areas as required by state law and the public trust obligations of the CSLC. To build upon this concern and the additional requests listed above, in this letter we further describe:

1. The potential for offshore wind power to play a critical role in meeting California's renewable energy goals.
2. Concern that the Projects do not avoid sensitive marine and terrestrial habitats and species, which should be a top priority for offshore wind proposals.
3. Remaining questions that exist after review of the DPEA.

Together, our organizations have long advocated for policies and actions to bring renewable energy, including offshore wind projects, to scale in an environmentally protective manner. We understand that developing renewable energy is pivotal for California to avoid the worst consequences of climate change, achieve a zero-carbon energy future, and maintain our thriving economy, healthy communities, and national role as an environmental leader.¹ Careful consideration of *how* we achieve this zero-carbon future is vital for protecting California's internationally treasured wildlife, landscapes, marine ecosystems, cultural resources, productive farmlands, and diverse habitats.

As it explores prospective offshore wind development, California has an opportunity and responsibility to become a visionary leader in offshore wind energy and create a planning process that sets a high environmental standard for this new technology and ocean use. In an October 21, 2019, letter that several of our organizations submitted to the California Energy Commission (CEC), we recommended that offshore wind energy must be developed responsibly, in a way that incorporates a range of stakeholder considerations and minimizes project specific and cumulative environmental impacts (see Attachment B). We again reiterated this in our

¹ For example, Audubon's scientists found that climate change may drive 389 species of North American birds to extinction if we cannot limit warming below 3 degrees Celsius. Chad B. Wilsey et al., *Survival by Degrees: 389 Bird Species on the Brink*, AUDUBON (2019), available at <https://www.audubon.org/climate/survivalbydegrees>. Also see: Trainer, V.L., Kudela, R.M., Hunter, M.V., Adams, N.G. and McCabe, R.M., 2020. Climate extreme seeds a new domoic acid hotspot on the US west coast. *Frontiers in Climate*, 2, p.23.

March 31, 2021, letter to CSLC. We believe such an approach would also benefit the industry, as siting and permitting will advance more expeditiously if use conflicts and environmental concerns are addressed ahead of the permitting process. That the Vandenberg Projects are called “demonstration” projects does not change the fact that inclusive and science-driven planning should precede any site specific project analysis. The Projects are not appropriately sited and have the potential to result in significant impacts to wildlife as a result of their locations. In addition, the Projects would do little to inform projects at scale in federal waters as they are not commensurate with projects under consideration in federal waters offshore California.

Our recommended approach, to utilize a seascape level planning process to progress offshore wind more efficiently and effectively, is supported by the 2021 SB 100 Joint Agency Report, which states:

“The benefits of using landscape-level approaches for renewable energy and transmission planning include early identification and resolution of large issues or barriers to development, coordinated agency permitting processes, increased transparency in decision making, increased collaboration, avoidance of impacts, and more rapid development of environmentally responsible renewable energy projects.”²

California and the wind industry are far better served by advancing projects in areas with strong support, and by ensuring that necessary safeguards exist for wildlife. Identifying environmentally responsible locations first will help ensure that offshore wind projects, and the industry, advance smoothly, without significant delay because of siting conflicts.

I. To Ensure the Success of Offshore Wind as Part of California’s Renewable Energy Future, Projects Must Be Appropriately Sited, Designed, and Operated.

California’s policy “to provide 100 percent of electricity retail sales and state loads from renewable and zero-carbon resources in California by 2045” will require aggressive development of renewable energy.³ The 2021 SB 100 Joint Agency report identifies out-of-state and offshore wind as an opportunity to reduce battery storage requirements. The report includes 10 GW of offshore wind in its core scenario, which is about 8% of current power producing capacity in the state.⁴ It will require careful planning to advance this important climate goal while ensuring minimal impacts to California’s coastal marine resources and ocean users. We encourage California to focus its staff resources on first prioritizing projects in federal waters as an alternative approach to achieving California’s renewable energy goals, as such locations may have a higher potential to avoid impacts to marine and coastal resources.

The DPEA describes some of the benefits of bringing California offshore wind projects online, including providing an opportunity for scientific and environmental analysis of the

² <https://efiling.energy.ca.gov/GetDocument.aspx?tn=237167&DocumentContentId=70349> at pg. 112

³ <https://www.energy.ca.gov/publications/2021/2021-sb-100-joint-agency-report-achieving-100-percent-clean-electricity>

⁴ SB 100 Joint Agency Report. March 15, 2021. <https://www.energy.ca.gov/publications/2021/2021-sb-100-joint-agency-report-achieving-100-percent-clean-electricity>

technology; employment to support the transition away from fossil fuels; and the ability to source renewable energy at times when solar is not active (dealing with the “duck curve” in the evening hours); among others. While we agree that offshore wind can benefit California as we work to achieve the state’s renewable energy goals, smart siting and appropriate safeguards must be in place to protect the environment from unnecessary impacts.

Given the importance of transitioning the state to renewable energy, it is key to build a foundation of trust in the offshore wind industry. This is done not only by fully engaging all stakeholders at the start and throughout the leasing and permitting process, but also by selection of sites with the greatest chances of success. The selection of sites in areas of environmental importance increases the potential for wildlife and habitat impacts, which is far from an ideal base to build trust in an emerging industry. Other areas along the California Coast that are farther from shore and have fewer conflicts with important habitat may have higher potential to avoid impacts to sensitive marine life than the Project area, which is adjacent to a state marine reserve and within an area layered with environmentally important designations, such as critical habitat, biologically important areas (BIAs), and others, as described within the DPEA and further discussed in this letter.

We remain committed to ensuring that all projects are sited, constructed, and operated in a manner that avoids impacts to marine and terrestrial species and habitats. Responsible siting and operation of offshore wind energy (i) avoids, minimizes, monitors, and mitigates adverse impacts on marine and coastal habitats and the wildlife that rely on them, (ii) reduces negative impacts on other ocean uses, (iii) includes robust consultation with Native American tribes and communities, (iv) meaningfully engages state and local governments and stakeholders from the outset, (v) includes comprehensive efforts to avoid impacts to environmental justice communities, and (vi) uses the best available scientific and technological data to ensure science-based and stakeholder-informed decision making. While there is urgency in tackling the climate crisis, California should not skip the important planning phase to rush through the permitting process for projects in problematic locations that will result in negative impacts to the environment. A well conducted planning process helps advance leases that will result in operational projects not mired in controversy.

II. The Proposed Siting of these Projects Threatens Sensitive Marine and Terrestrial Species and Habitats.

For decades, our organizations have worked with state and federal agencies to secure precedent-setting protections for the ocean and coast. Maintaining the health of ocean ecosystems is essential to California’s robust economy, the livelihoods of many California residents, and securing the sustainability of marine life in the region. Moreover, Californians—and many other residents of the U.S.—have made a strong public commitment to preserving California’s coast and ocean and the marine wildlife that depend upon them. Protecting California’s marine environment is ecologically, socially, and economically beneficial to the state and nation.

The Intergovernmental Panel on Climate Change (IPCC) *Special Report on Oceans and Cryosphere in a Changing Climate*,⁵ released on September 24, 2019, underscores the imperative of conserving biodiversity to maintain human life. Preserving intact marine habitat is essential to protecting biodiversity. The IPCC report found that coastal land and sea use change has had the second largest impact on marine biodiversity over the past fifty years. Scientists recommend highly protecting at least 30 percent of the marine environment by 2030 to preserve ecosystem function and enhance climate resilience.⁶ Offshore wind development would constitute a new industrial use of the ocean. As state and federal agencies consider offshore wind, preserving the ecological integrity of known biological hotspots—including the Projects' areas—is critical. In fact, the National Oceanic and Atmospheric Administration (NOAA) has described this location as an ecological hotspot: "Ecological hotspots occur in continental shelf and nearshore waters from Point Conception through the northern Channel Islands, where spatial patterns of bird, fish, invertebrate, and mammal habitat overlap."⁷ Image 1 shows that this hotspot includes the Project area, even though it is just northwest of Point Conception.

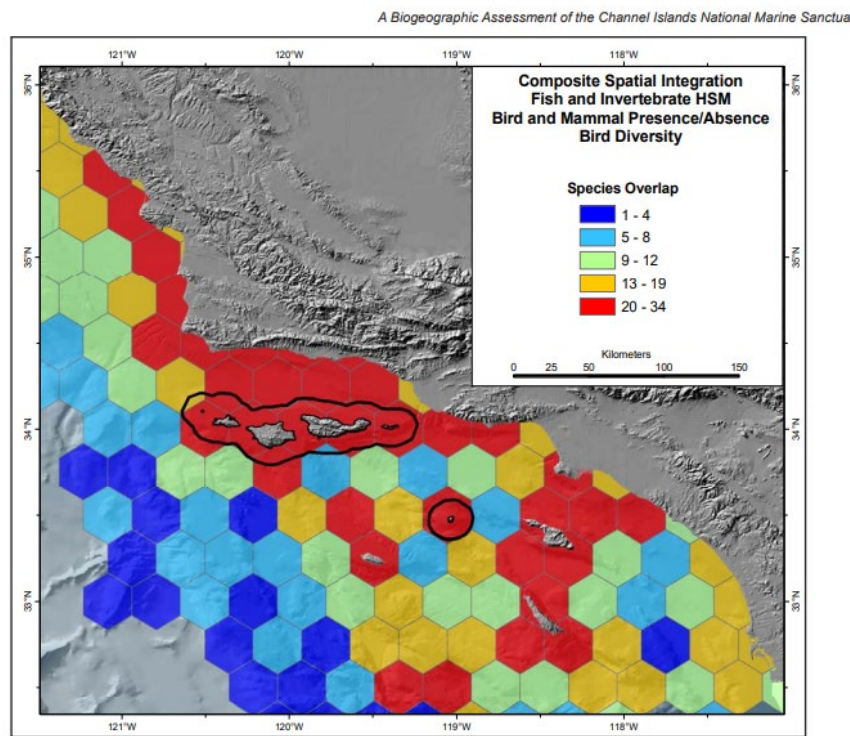


Figure 7.2.6. Composite spatial integration of bird, fish, invertebrate, and mammal data off southern California.

Image 1: Species overlap in the Project area.⁸

⁵ <https://www.ipcc.ch/srocc/>

⁶ Dinerstein et al. 2019. A global deal for nature: guiding principles, milestones, and targets. Science Advances. 19Apr2019. Volume 5, Issue 4. Available at: <https://www.science.org/doi/10.1126/sciadv.aaw2869>

⁷ NOAA National Centers for Coastal Ocean Science (NCCOS). 2005. A Biogeographic Assessment of the Channel Islands National Marine Sanctuary: A Review of Boundary Expansion Concepts for NOAA's National Marine Sanctuary Program. Prepared by NCCOS's Biogeography Team in cooperation with the National Marine Sanctuary Program. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 21. 215 pp.

⁸ *Id.*

California coastal communities have already begun to feel the impacts of climate change in the form of sea level rise, extreme temperature events, fires, mudslides, droughts, and more. The communities and environment near the Vandenberg Projects have also borne a heavy burden from the extraction of fossil fuels, most notably during the 1969 Santa Barbara Oil Spill, 1997 Torch Pipeline Oil Spill, and 2015 Refugio Oil Spill. These communities deserve the opportunity to benefit from renewable energy projects that do not further harm the ocean and coast. As noted below, numerous important species found in the area's waters have "nearshore affinity;"⁹ thus, offshore wind development in state waters would likely have an even greater impact on these biological resources than alternative sites farther offshore.

California should use environmental and social spatial data to select appropriate sites that have optimum offshore wind energy potential with the least degree of environmental and social impacts. This involves identification and mapping of any persistent hotspots of species abundance and/or areas of rare environmental significance while reviewing potential development areas. Significant areas include, but are not limited to, state Marine Protected Areas (MPAs), critical breeding and feeding habitats for wildlife (such as Audubon Marine Important Bird Areas (IBAs)), Cetacean Density and Distribution Mapping BIAs, critical habitat for Endangered Species Act-listed species, Habitat Areas of Particular Concern, and regionally relevant areas. Federal leasing is prohibited within the boundaries of the National Marine Sanctuary (NMS) System. 30 C.F.R. § 585.204. As per the "mitigation hierarchy," which seeks to first avoid, then minimize, and mitigate potential environmental impacts from all stages of offshore wind development,¹⁰ and as required by the California Environmental Quality Act (CEQA),¹¹ avoidance of sensitive habitat should be the priority. The Projects proposed in the DPEA fail to avoid several known areas of significance.

The location of the Projects is adjacent to six onshore Audubon IBAs that are included in an international program to identify high conservation areas for birds. Those IBAs include Point Conception 120W34N, Point Conception 121W34N, Vandenberg Air Force Base, and Santa Ynez Sanctuary IBA, which together provide key habitat for over 20 species of seabirds. Long-term data sets show the importance of the Vandenberg State Marine Reserve (VSMR) for Brandt's and pelagic cormorants, rhinoceros auklets, pigeon guillemots, and California brown pelicans—all of which are vulnerable to collision and habitat displacement in state waters squarely within the foraging areas of these breeding and roosting colonies.¹² The largest seabird breeding colonies off Point Conception are concentrated along coastal bluffs immediately parallel to proposed turbine locations, including hundreds of cormorants, western gulls, and

⁹ <https://www.ipcc.ch/srocc/>

¹⁰ IUCN and The Biodiversity Consultancy. "Mitigating biodiversity impacts associated with solar and wind energy development: guidelines for project developers" (2021). Available at: <https://portals.iucn.org/library/node/49283>. Please note that the IUCN document provides general guidelines on how the mitigation hierarchy could be and has been applied, but its application in each case will be context and site-specific, and based on best available scientific information and technologies available at the time.

¹¹ Public Resources Code § 21002 ("[I]t is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects".).

¹² <https://databasin.org/maps/new/#datasets=e6dba80c73f546058e4dbab23abdcab0> California Seabird Colony – Summary Bird Abundance.

pigeon guillemot; with close proximity to feeding grounds, breeding seabird and wind turbine interactions are inevitable. However, perhaps at even greater risk, the proposed Project locations are within the immediate migratory pathway of hundreds of thousands, if not millions, of seabirds navigating upwelling resources along the California Current, with Point Conception experiencing particularly high concentrations. More detailed concern for potential interactions with birds is described below in Section IIIB. The Projects also overlap with important habitat for several marine mammal and sea turtle species. (See Section IIIA and Attachment A for more details on these concerns.) The image below shows predicted summer seabird abundance along this stretch of the California Coast (black polygon is the approximate proposed location of the Projects), indicating the Projects would be within an area of highest predicted abundance.¹³

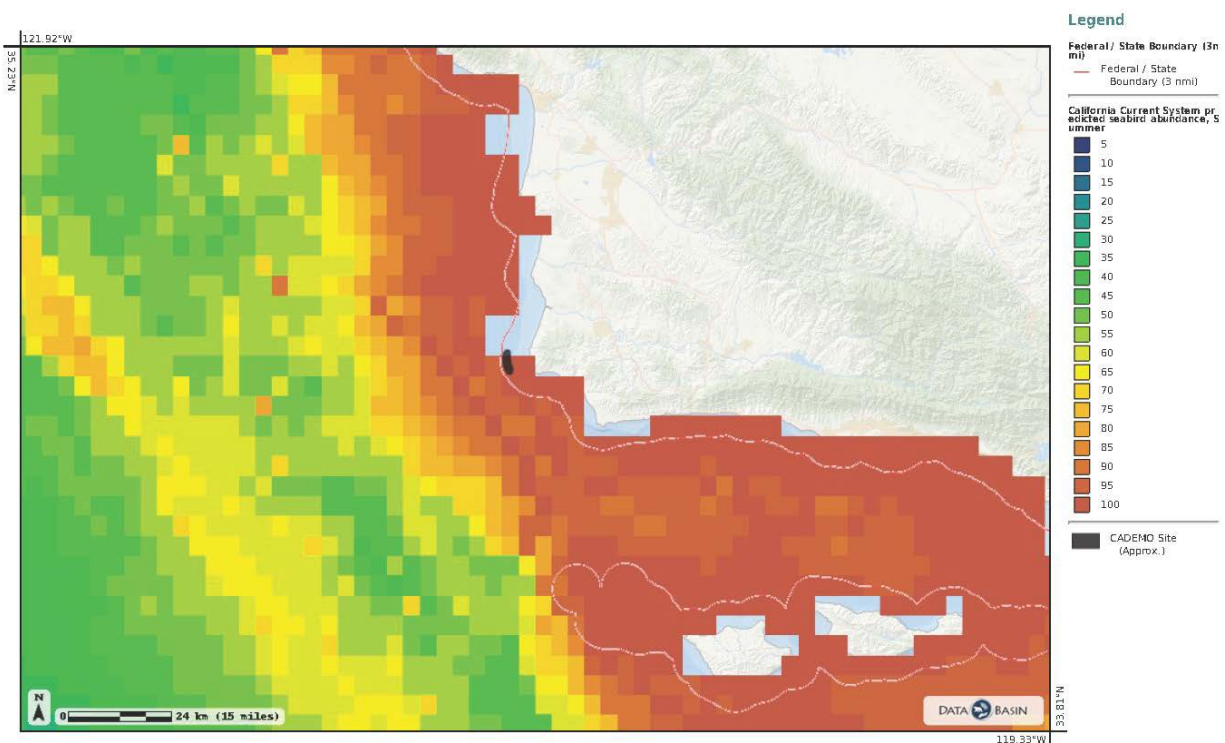


Image 2. Seabird Abundance in and near the Project area.¹⁴

In describing the locations of the Vandenberg Projects, the DPEA itself paints a picture of an area along the California Coast that is vital to regional marine productivity. For example, the DPEA notes the Project areas are:

1. Near a part of the coast and nearshore waters included in the CSLC’s Significant Lands Inventory (which is described as “a 1-mile strip of tidelands and submerged land in the Pacific Ocean immediately offshore of VSFB”). This area was included in the Inventory in part because of the presence of California brown pelican, California least tern, and

¹³ DataBasin. Potential CADEMO offshore wind farm site.

<https://databasin.org/maps/f1d3a4ae02f44b6f99ae2cd591370807/>

¹⁴ *Id.*

- large numbers of shorebirds. These birds extend beyond that 1-mile mark offshore into the Project area. (DPEA at 4-11)
2. Within an area of strong seasonal upwelling and high primary production—conditions that support “abundant and diverse habitats.” (DPEA at 4-11)
 3. Directly adjacent to the VSMR (DPEA at 4-12), which has the highest level of protection in California’s MPA network.
 4. Home to multiple species of concern and those protected under both Federal and State regulations, including: “Federal and State Endangered Species Acts (ESAs); the Marine Mammal Protection Act (MMPA); Migratory Birds Act; Magnuson-Stevens Fishery Conservation and Management Act; the California Department of Fish and Wildlife (CDFW) Fish and Game Codes; the National Oceanic and Atmospheric Administration (NOAA) species of concern lists; the U.S. Fish and Wildlife Service (USFWS) regulations; and the California Coastal Commission (CCC) that designate species as having a scientific, recreational, ecological, or commercial importance under the Coastal Act.” (DPEA at 4-13; Migratory Bird Treaty Act misnamed as “Migratory Bird Act”)
 5. Supporting approximately 40 species of marine mammals (DPEA at 4-13); at least five species of sea turtles (DPEA at 4-17); endangered black and white abalone (DPEA at 4-17); many commercially, recreationally, and ecologically important species of fishes (DPEA at 4-17), including special status fish species (DPEA at 4-19); numerous species of marine birds (at least 54) and bats (DPEA at 4-21), some of special status with potential occurrence in the project areas. (DPEA at 4-22)
 6. Along the Pacific Flyway migration route. (DPEA at 4-21)
 7. Largely undeveloped open space with intact Central Coast scrub, maritime scrub, coastal bluff, dune scrub, floodplains, wetlands, riparian, and littoral habitats (DPEA at 4-30) that support myriad species, including special status invertebrates, fish, amphibians, reptiles, and birds. (DPEA Table 4-1)

The descriptions of how the Projects would be sited to avoid environmental impacts are grossly inadequate. We strongly disagree that these Projects, as sited, would avoid sensitive biological resources to the extent practicable. In Section 2.2.2 on site selection, there is little mention of how these sites were selected to avoid impacts to the incredibly diverse marine environment, as described in the DPEA and summarized above. The Ideol project description states the siting considered “[o]ther possible environmental considerations.” (DPEA at 2-8) The CADEMO project description merely states that the site has “[f]ew environmental constraints (avoids activities within the Vandenberg State Marine Reserve.” (DPEA at 2-8) However, any industrial development adjacent to an MPA – designated for the benefit of conservation – could have impacts on that MPA’s marine resources and the ability of that site to achieve its full conservation potential. Protected areas have defined boundaries that reflect administrative compromises and do not represent the definite presence/absence of species. Areas near the edges of protection zones should be considered important for the species and habitats protected by the designations (e.g., MPA, critical habitat, etc.). As such, the border of the VSMR should not be the first place we consider for the development of a new technology, such as floating offshore wind.

Notably, this area is also near the Pt. Conception Marine Reserve, another vital part of California's MPA network.¹⁵ In addition, it is within the proposed Chumash Heritage National Marine Sanctuary (CHNMS), which was nominated in 2015 for its rich ecological resources and cultural significance, including Chumash Sacred Sites.^{16,17} NOAA's Office of National Marine Sanctuaries renewed the nomination in 2020,¹⁸ indicating support from NOAA to protect this area. The 2020 review identified that this is an "area of national significance" and that there is "broad community support for the nomination."¹⁹

In addition to being on the boundary of VSMR, the effectiveness of California's MPA network relies not only on the protections individual MPAs afford but on the connectivity of the entire MPA network.²⁰ The Project areas are also within the proposed CHNMS, and overlap or border several other protection zones, such as critical habitat for many species, as noted in the DPEA. (Tables 4-3, 4-4, 4-5, 4-7, and 4-8) Since the March 31, 2021, letter (Attachment A), the critical habitat update for humpback whales was finalized. (A supplemental letter was sent on April 21, 2021, with this information.) We are pleased to see this update included in Table 4-3, as it overlaps with the Project areas. Lacking in the DPEA, however, are BIAs for gray and blue whales, as we mentioned in our previous letter and again focus on in this letter. We also reiterate our reference to a 2005 biogeographic assessment by the NMS Program, which has more detail about the area around Point Conception, near the Project areas.²¹

(See Image 3 on next page)

¹⁵ <https://wildlife.ca.gov/Conservation/Marine/MPAs/Network#29097816-marine-life-protection-act>

¹⁶ <https://chumashsanctuary.com/>

¹⁷ <https://chumashsanctuary.com/about/sacred-sites/>

¹⁸ Review of Nomination for the Chumash Heritage National Marine Sanctuary. 85 Fed. Reg. 61935 (October 1, 2020)

¹⁹ *Id.*

²⁰ Saarman E., Gleason M., Ugoretz J., Airamé S., Carr M., Fox E., Frimodig A., Mason T., Vasques J. (2013) "The role of science in supporting marine protected area network planning and design in California," Ocean and Coastal Management.

²¹ NOAA National Centers for Coastal Ocean Science (NCCOS). 2005. A Biogeographic Assessment of the Channel Islands National Marine Sanctuary: A Review of Boundary Expansion Concepts for NOAA's National Marine Sanctuary Program. Prepared by NCCOS's Biogeography Team in cooperation with the National Marine Sanctuary Program. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 21. 215 pp.

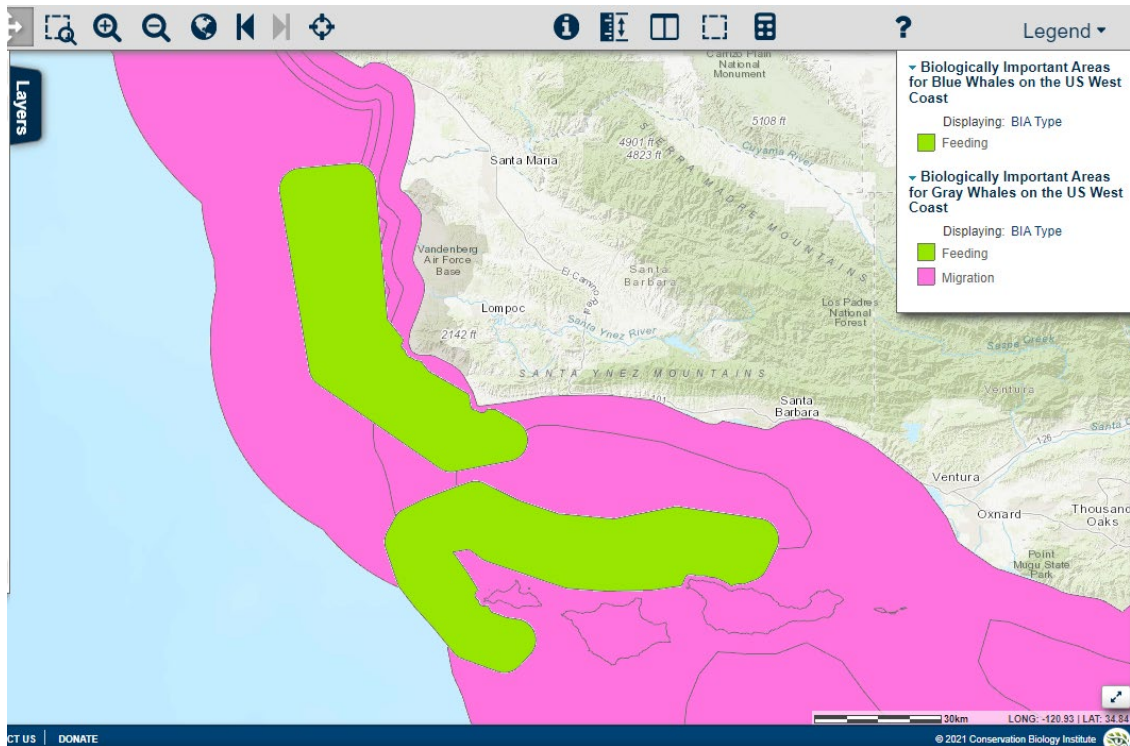


Image 3: Biologically Important Areas for blue (migration) and gray (feeding) whales in the Project area. Gray whales only have the migration layer (not feeding) represented in this spatial extent; the green polygons are blue whale feeding BIAs.²²

Further, not all ecologically important marine areas are protected, and continued public input will be vital to ensure such places are identified and analyzed before siting decisions for offshore wind project developments are made. For example, detailed analysis exists for only a small number of marine mammals occurring in the areas of interest for offshore wind. For many of the species with known distributions, the data are not fine enough to make localized decisions. Near- and long-term research is needed on killer whales, beaked whales, fin whales, and minke whales, and there is a need to delineate BIAs for those species. Because of examples like this, we need to adopt a precautionary approach in siting and invest in data collection to inform future marine planning decisions. In addition, an analysis of climate-induced shifts and how those may impact marine mammal distribution will be complex, yet such an analysis will greatly benefit the planning process.

BOEM recently completed a study on seabird and marine mammal abundances along the Central Coast, the *Pacific Marine Assessment Partnership for Protected Species* (PacMAPPS)²³ study, and is still in process on the *Seabird and Marine Mammal Surveys Near Potential Renewable Energy Sites Offshore Central California*,²⁴ Data Synthesis and High-resolution Predictive Modeling of Marine Bird Spatial Distributions on the Pacific OCS,²⁵ Over Water

²² Databasin.org

²³ https://www.boem.gov/sites/default/files/documents/environment/PC-17-04_0.pdf

²⁴ https://www.boem.gov/sites/default/files/documents/environment/PC-17-01_0.pdf

²⁵ https://www.boem.gov/sites/default/files/documents/environment/PC-15-01_0.pdf

Migration Movements of Black Brant,²⁶ and ADRIFT: Spatial and Temporal Distribution of Cetaceans in the California Current Ecosystem Using Drifting Archival Passive Acoustic Monitoring²⁷ studies. These studies have the potential to fill some critically important data gaps and should influence siting decisions. The PacMAPPS study has the potential to include at least three years of monthly ship and aerial pre-development baseline data on the presence and abundance of key species, including marine mammals and seabirds. This would dramatically bolster the statistical integrity of the data sets and set a high environmental bar.

In addition to the conflicts offshore, the Projects would also impact terrestrial resources in a largely undeveloped, contiguous block of relatively pristine native vegetation. As the DPEA describes, this area includes “a wealth of ecological resources” (DPEA at 4-30) that include special status species (DPEA at 4-33, 4-34). Proposed onshore substation development within critical habitat designations of the western snowy plover, one of the largest breeding colonies in California, and potential impacts to foraging birds from adjacent endangered California least tern nesting colonies at the Santa Ynez Estuary are of heightened concern. Overhead transmission lines paralleling the coast pose risks to migrating land and seabirds in the area, in addition to amplifying fire danger. The Projects pose real and significant risks to important seabird breeding colonies, coastal migrants, threatened and endangered birds and mammals, and increased fragmentation of one of the most undeveloped regions of the California coast. When siting offshore wind projects, it would be preferable to choose a location that has existing transmission capacity to reduce impacts to terrestrial resources.

The CEC, as part of its work on implementing SB 100, has developed a methodology for identifying least conflict areas that are appropriate for renewable energy development and transmission investments.²⁸ While this work is currently focused on terrestrial renewable energy development, the methodology in conjunction with data from the California Offshore Wind Gateway²⁹ and incoming data can be rapidly applied to help inform the responsible development of offshore wind. Identification of least conflict areas for offshore wind development would increase project viability and certainty and could allow for an expedited process in permitting offshore wind projects in the future.

Given the importance of protecting California’s natural capital, which drives the state’s ocean economy, we would like to work with you to ensure siting decisions reflect an unwavering commitment to protecting the marine environment. Implementing a deliberative planning process that prioritizes environmental protection and considers stakeholders’ interests will demonstrate environmental leadership that will benefit this burgeoning industry while protecting California’s rich natural resources.

²⁶ https://www.boem.gov/sites/default/files/documents/regions/pacific-ocs-region/environmental-analysis/PC-20-01-profile_0.pdf

²⁷ <https://www.boem.gov/sites/default/files/documents/regions/pacific-ocs-region/environmental-analysis/PC-20-04.pdf>

²⁸ <https://www.energy.ca.gov/event/workshop/2021-08/joint-agency-workshop-next-steps-plan-senate-bill-100-resource-build>

²⁹ <https://caoffshorewind.databasin.org/>

III. The DPEA Fails to Adequately Address Several Issues Regarding Impacts and Alternative Sites.

Additional information is necessary to fully address the potential impacts of the proposed Projects on the marine environment. The proposed Projects will result in many impacts, including cumulative impacts, that are not addressed in the DPEA. Due to these unavoidable impacts and conflicts because of the Projects' locations, the state must consider alternative sites for offshore wind development.

A. The DPEA Omits Important Fish and Deep-Sea Coral Species.

The DPEA should include two rockfish species, yelloweye and cowcod, which are protected in state waters ("no-take"); yelloweye is considered overfished.^{30,31} The preferred habitat for these species is rocky areas greater than 40 fathoms, which may be impacted by anchors and cables.³²

Great white shark is another species omitted in the DPEA that should be included. Great white sharks have experienced regional population growth³³ and may be in the vicinity of the Projects. The DPEA should address the potential for interaction between the Projects and great white sharks, including potential attraction or displacement due to structures in the water, noise, and vibration, in addition to secondary entanglement risk.

The DPEA also omits discussion of deep-sea corals. Corals in both hard bottom and soft sediment could be impacted by the Projects due to the physical disturbance of the seafloor during construction and operation. This may include an increased sediment load that could choke corals and other species.³⁴

B. The Discussion Regarding Marine Mammals and Sea Turtles Lacks Important Information.

The DPEA mentions leatherback sea turtle and other turtle species of special status (at 4-17, Table 4-4), but fails to mention that the Project areas overlap with leatherback sea turtle critical habitat. The southern extent of leatherback sea turtle critical habitat is Point Arguello.³⁵

³⁰<https://wildlife.ca.gov/Conservation/Marine/Groundfish/Tracking#:~:text=Yelloweye%20rockfish%20is%20a%20federally,monthly%20catch%20estimates%20by%20area>.

³¹ <https://wildlife.ca.gov/Conservation/Marine/Cowcod>

³² <https://www.fisheries.noaa.gov/west-coast/sustainable-fisheries/west-coast-groundfish-closed-areas>

³³ Kanvine et al. 2021. Estimates of regional annual abundance and population growth rates of white sharks off central California. Biol. Cons. Vol. 257, 109104. Available at:

<https://www.sciencedirect.com/science/article/pii/S0006320721001567>

³⁴ Jones R, Fisher R, Bessell-Browne P (2019) Sediment deposition and coral smothering. PLOS ONE 14(6): e0216248. <https://doi.org/10.1371/journal.pone.0216248>

³⁵ 77 FR 4169 February 27, 2021. https://www.ecfr.gov/cgi-bin/text-idx?SID=79c870d9a02a7e22b18473ef2efb7556&mc=true&node=se50.10.226_1207&rgn=div8

The DPEA mentions that the Project locations are at the northern or southern extent of range for some species of marine mammals, though it does not specify which. (DPEA at 4-13)

In addition, the data on gray whale distance from shore should be updated, especially in consideration of the stress the species has had in recent years from unconfirmed causes, including unusual mortality events in recent years.^{36,37}

The DPEA relies on outdated information for the southern sea otter and misrepresents sea otter residence in the coastal zone of the Project area (DPEA at 4-13). Estes and Jameson (1983) references a small sample size, and the population density and demographics have changed in the last 38 years. Sea otters do not have a defined breeding season and they no longer migrate away from the region; thus, the Bonnell et al. (1983) and Estes and Jameson (1983) citations are dated and should be clarified or, preferably, struck. The most current range information can be found in Hatfield et al. (2019),³⁸ which should be used for a reference to make any statements about population size or range as it is the most current census.

The DPEA is silent on the use of high resolution geophysical (HRG) surveys for site assessment and characterization activities necessary prior to construction. Equipment used for HRG surveys can produce noise at source levels and frequencies that are potentially harmful to marine mammals. As such, this activity should be evaluated in the DPEA.

Finally, as we discussed in our March 31, 2021, letter and as noted in the DPEA (DPEA at 2-12), vessels used during construction and operation may impact whales through direct ship strikes. This issue is not adequately addressed in the DPEA. The DPEA also does not address how vessels may impact southern sea otters during construction and operation. The siting, construction, and maintenance of transmission lines to onshore substations can be expected to have adverse impacts on sea otters residing along this coastal region and potentially on the seal rookeries at Vandenberg.

C. The DPEA Fails to Adequately Disclose Potential Harm to Birds.

The DPEA is inadequate in the following sections and topics in its preliminary assessment of the potential impacts of the proposed Projects on marine birds:

1. 2.3.4. Table 2-1. Summary of Comments from Agencies and Ports

The DPEA omits specific statutes and conservation obligations that protect birds, including:

³⁶ Christiansen F, Rodríguez-González F, Martínez-Aguilar S, Urbán J and others. 2021. Poor body condition associated with an unusual mortality event in gray whales. *Mar Ecol Prog Ser* 658:237-252. <https://doi.org/10.3354/meps13585>

³⁷ <https://www.livescience.com/four-dead-gray-whales-in-san-francisco.html>

³⁸ Hatfield, B. B., J. L. Yee, M. C. Kenner, and J. A. Tomoleoni. 2019. California sea otter (*Enhydra lutris nereis*) census results, spring 2019. U.S. Geological Survey Data Series 1118, Reston, Virginia, USA. <https://doi.org/10.3133/ds1118>.

- Migratory Bird Treaty Act
 - California Fish & Game Code section 3513 – Take under Migratory Bird Treaty Act
 - Fish & Wildlife Conservation Act as amended in 1988
 - Executive Order (EO) 13186 “Responsibilities of Federal Agencies to Protect Migratory Birds,” and
 - North American Waterbird Conservation Plan.
2. Errata: p. 4-13 error: Migratory Bird Treaty Act.
 3. Table 2.2. Summary of Comments from ENGOS

The DPEA mis-characterizes our concerns for the impacts of the proposed Projects on birds as only collision with turbines with a special concern for California brown pelican. We have stated repeatedly that there are three potential impacts of the proposed projects on many species of birds, which are also well-defined in the BOEM/U.S. Geological Survey (USGS) study titled Collision and Displacement Vulnerability among Marine Birds of the California Current System Associated with Offshore Wind Energy Infrastructure (OCS Study, BOEM 2016-043):

- collision with turbines,
- displacement and barrier effect, and
- population level impact on vulnerable populations of seabirds.

California brown pelican was highlighted in previous comment letters as an example of an important species to consider because:

- The species was formerly listed under the ESA and is currently state listed;
- The BOEM/USGS document ranks California brown pelican as the highest in population collision vulnerability with turbines of all the species of birds in the California Current System (CCS);³⁹ and
- The only breeding colonies of California brown pelicans in the western United States are within Channel Islands National Park on West Anacapa and Santa Barbara Islands. These colonies are not far from the Projects, and the birds forage in the Project area.⁴⁰

We ask that the PEA correct this mischaracterization and include our concerns for all the impacts of the Projects on the 81 species of seabirds that are found in the CCS as stated and ranked in the publication cited below:

For 81 marine bird species present in the CCS, we created three vulnerability indices: Population Vulnerability, Collision Vulnerability, and Displacement Vulnerability. Population Vulnerability was used as a scaling factor to generate two comprehensive indices: Population Collision Vulnerability (PCV) and Population Displacement Vulnerability (PDV). Within the CCS, pelicans, terns (Forster's [Sterna forsteri],

³⁹ Adams, J., Kelsey, E.C., Felis, J.J., and Pereksta, D.M., 2017, Collision and displacement vulnerability among marine birds of the California Current System associated with offshore wind energy infrastructure (ver. 1.1, July 2017): U.S. Geological Survey Open-File Report 2016-1154, 116 p., <https://doi.org/10.3133/ofr20161154>

⁴⁰ <https://www.nps.gov/chis/learn/nature/brown-pelican.htm>

Caspian [Hydroprogne caspia], Elegant [Thalasseus elegans], and Least Tern [Sternula antillarum]), gulls (Western [Larus occidentalis] and Bonaparte's Gull [Chroicocephalus philadelphia]), South Polar Skua (Stercorarius maccormicki), and Brandt's Cormorant (Phalacrocorax penicillatus) had the greatest PCV scores. Brown Pelican (Pelicanus occidentalis) had the greatest overall PCV score. Some alcids (Scripps's Murrelet [Synthliboramphus scrippsi], Marbled Murrelet [Brachyramphus marmoratus], and Tufted Puffin [Fratercula cirrhata]), terns (Elegant and Least Tern), and loons (Yellow-billed [Gavia adamsii] and Common Loon [G. immer]) had the greatest PDV scores. Ashy Storm-Petrel (Oceanodroma homochroa) had the greatest overall PDV score. To help inform decisions that will impact seabird conservation, vulnerability assessment results can now be combined with recent marine bird at-sea distribution and abundance data for the CCS to evaluate vulnerability areas where OWEI [offshore wind energy infrastructure] development is being considered. Lastly, it is important to note that as new information about seabird behavior and populations in the CCS becomes available, this database can be easily updated and modified.⁴¹ (Emphasis added).

We also ask that the PEA use the vulnerability assessment combined with recent marine bird at sea distribution and abundance data in the Project area.

New data will be released by BOEM on distribution and abundance of birds in the CCS and the PEA should perform the synthesis recommended by BOEM above.

4. 4.2.3 Biological Resources

The DPEA attempts to analyze the impacts on Biological Resources – Marine in this section. However, the document begins with a statement of “significant environmental values” of a one-mile strip of Unconveyed State School Lands and Tide and Submerged Lands Possessing Significant Environmental Values (CSLC 1975). The “assessment” states “[s]pecifically, these lands are within the range of California brown pelican and California least tern, and the area is known to have large numbers of shorebirds.” This statement from a 45-year old document is misleading and suggests that California brown pelican and California least tern and shorebirds are the only species in this area. There are seabirds, migratory birds, and waterbirds as well.

5. The cited statements in the DPEA are not relevant to the Proposed Projects

The analysis of birds relies heavily on one source: “At-sea Distribution and Abundance of Seabirds off Southern California: A 20-year Comparison”⁴² and selects citations from this

⁴¹ Adams, J., Kelsey, E.C., Felis, J.J., and Pereksta, D.M., 2017, Collision and displacement vulnerability among marine birds of the California Current System associated with offshore wind energy infrastructure (ver. 1.1, July 2017): U.S. Geological Survey Open-File Report 2016-1154, 116 p., <https://doi.org/10.3133/ofr20161154>.

⁴² Mason et al. 2007. At-sea distribution and abundance of seabirds off Southern California: a 20-year comparison. Published in Studies in Avian Biology, No. 33, Cooper Ornithological Society.

aggregation of aerial surveys conducted in May through January 2002 from Cambria to the Mexican border.

The DPEA states “Mason et al. (2007) identified 54 species off southern California during coastal and at-sea surveys (from Cambria to the Mexican border), representing 12 different families. Nearshore seabirds tend to occur close to shore in relatively shallow waters.”

Our limited review of the publication found, however, that the surveys for this data were only conducted on transects that were less than a mile from shore as reported in the publication.

Surveys were conducted from a high-winged, twin-engine Partenavia PN 68 Observer aircraft following methods developed for seabird observation by Briggs et al. (1985a, b; 1987). We flew surveys at 60 m above sea level at 160 km/hr ground speed and flew coastline (mainland and island) transects 300 m from shore.⁴³

The cited distance, 300 meters, is less than one mile from the coast. The proposed projects are between two to three miles from the coast. General statements in the DPEA such as “Pelagic seabirds occur in deeper waters, typically farther from shore than the nearshore species described above” (no citation, DPEA at 4-20) are misleading without more exact measurements. “Farther” includes the proposed Project area.

Therefore, we recommend: 1) CSLC should rely on the 2017 BOEM/USGS report and more recent data to determine vulnerability and increase the number of species of seabirds which could be vulnerable to the impacts of the projects; and 2) CSLC should rely on Moore et al. only for nearshore species of seabirds and waterbirds and not for the Project area, and look at other sources for initial data on seabirds and waterbirds in the area of the proposed project, including Briggs et al., Bird Communities a Sea Off California: 1975-1983, Studies in Avian Biology No. 11, 1987, and the upcoming BOEM/USGS transect surveys off Central California.

6. DPEA is deficient on data on migratory birds and bats

has provided comments to CSLC on the DPEA on the high risk to migratory birds and bats that fly through the rotor-swept zone of the proposed project areas. To accurately detect the magnitude, timing, and altitude of birds and bats flying through the proposed Project area, considering the best available science for the DPEA and the possible environmental analysis, the CSLC should consider requiring the Project proponents to determine the usage of the Project areas in several migratory seasons using marine radar during day and night.

For a proposed offshore wind project in the Great Lakes, six miles from the coast in Lake Erie, the Ohio Power Siting Board and Ohio Department of Natural Resources permit includes a condition that requires the developer to provide data using vertical radar on the site for at least one year and possibly two migratory seasons on birds crossing the Lake at night and day above and through the rotor-swept zone to determine risk before the project can begin to move forward.

⁴³ *Id.*

Additionally, the data must be approved by the Ohio Department of Natural Resources.⁴⁴ The project proponent in the Great Lakes has elected to use a floating platform on which to secure the radar unit and the Ohio Department of Natural Resources requires that 70% of the data must be useable. Other on-site studies have been done with a secure platform. These studies are critical for understanding the risk to migratory birds for any environmental analysis and should be conducted before any nearshore project can move forward, since it is so close to the coast on the Pacific Flyway, as CDFW has commented.

Additionally, standard practice for permitting agencies at the county level is to require on-site protocol level bird-use surveys over one or two years for preparation of an environmental review of a project. CSLC should at minimum require two years of these surveys and data collection including on-site marine radar before beginning environmental review.⁴⁵

7. Table 4-8. Special Status Marine Bird Species with Potential Occurrence in Project Areas

This table is inadequate as it does not seem to include onshore cable landing or infrastructure as “Project area” and does not include the following listed and special status species:

- Short-tailed albatross, a federally endangered species under the ESA.⁴⁶ A history of sightings off California⁴⁷ and eBird data and range map⁴⁸ for the species show its continued and growing presence in California waters, including in the Project area.
- California least tern,⁴⁹ listed as endangered under both federal and state ESAs (and a fully protected species under California law⁵⁰), which nests on beaches but forages in the Project area, as the Project area includes onshore cable landings and infrastructure.
- Western snowy plover⁵¹ nests on the California Coast and is listed as threatened under the ESA.

The USFWS has released Birds of Conservation Concern 2021.⁵² These birds are considered special status species. Birds on the list that may migrate through the areas or seabirds that appear in the BOEM/USGS document on vulnerability of 81 species should be included as special status Species in the Project area whether they forage, fly through, or migrate through the Project area. Additionally, CDFW has prepared a list of California Bird Species of Special Concern.⁵³ Any species that occurs in the Project area, including during migration, should be considered as special status species in the CSLC’s review.

⁴⁴ <http://dis.puc.state.oh.us/TiffToPdf/A1001001A20E21B35239G02930.pdf>

⁴⁵ See Alta East wind project DEIR <https://psbweb.co.kern.ca.us/planning/pdfs/eirs/AltaEast/Index.htm>

⁴⁶ <https://www.fws.gov/oregonfwo/articles.cfm?id=149489452>

⁴⁷ http://creagrus.home.montereybay.com/CA_STAL.html

⁴⁸ <https://ebird.org/species/shtalb>

⁴⁹ https://www.fws.gov/sacramento/es_species/Accounts/Birds/ca_least_tern/

⁵⁰ Cal. Fish and Game Code § 3511(b)(6).

⁵¹ <https://www.fws.gov/arcata/es/birds/wsp/plover.html>

⁵² <https://www.fws.gov/migratorybirds/pdf/management/birds-of-conservation-concern-2021.pdf>

⁵³ <https://wildlife.ca.gov/Conservation/SSC/Birds>

8. Table 4-8. Potential Magnitude of Environmental Effect

Habitat Alterations should be changed to potentially Significant, as the turbines may displace marine life which may have to avoid the turbines during migration or foraging activities. This displacement has been demonstrated to be a significant impact in the EU and United Kingdom.⁵⁴

In conclusion, the DPEA should rely on the framework of research and practices that includes: 1) seabird density and abundance data forthcoming from BOEM and other scientists, which will show that seabird density is much greater closer to the coast within three miles than it is twenty miles or more out at sea, for instance; 2) a note of precaution that other states that have considered offshore wind demonstration and commercial projects, even of only one turbine, have only considered projects six miles (Great Lakes), eight miles (Rhode Island), or 12 miles (Maine) from the mainland coast, and not closer than that. Rhode Island and Maine conducted extensive stakeholder planning processes before locating a demonstration project off the states' coasts.⁵⁵ Virginia's demonstration project is located 27 miles from the coast.⁵⁶ In fact, New Jersey declined to permit a project off its coast within five miles, in part because a pilot scale project would not produce a net economic benefit,⁵⁷ and because of testimony from National Wildlife Federation and New Jersey Audubon on the potential impacts on birds (public testimony available on request); and 3) the mitigation hierarchy of addressing impacts,⁵⁸ which is also used to address impacts in environmental review, is to first avoid potentially significant impacts through a robust alternatives analysis, and to minimize and mitigate impacts for which avoidance is not possible, where mitigation may include offsets for the impacts with compensatory mitigation where such offsets can be shown to be effective. We suggest that the cumulative, direct, and indirect impacts on birds are so potentially numerous from these Projects that these significant impacts should be completely avoided by not moving forward with these proposals.

D. The DPEA Omits Consideration of Cumulative Impacts.

The DPEA does not consider cumulative impacts, which are of utmost importance when evaluating offshore wind siting and development. The siting of wind turbines can have cumulative impacts on migrating bird populations, bats, fisheries, marine mammals, and even changes to upwelling, to name a few issues. It is not feasible to analyze cumulative impacts if the state is considering multiple individual permits and not analyzing them as a network with shared, cumulative impacts. Considering the importance and high public value of California's marine resources, we recommend that CSLC analyze and model the potential synergistic and cumulative impacts of projects under present and future ocean conditions before considering any leases.

⁵⁴ https://www.researchgate.net/publication/304563260_Displacement_of_seabirds_by_an_offshore_wind_farm_in_the_North_Sea

⁵⁵ <https://seagrant.gso.uri.edu/oceansamp/>; <https://www.maineoffshorewind.org/>

⁵⁶ <https://www.dominionenergy.com/projects-and-facilities/wind-power-facilities-and-projects/coastal-virginia-offshore-wind>

⁵⁷ <https://www.njspotlight.com/2018/12/18-12-18-state-rejects-atlantic-city-offshore-wind-project-for-third-time-too-pricey/>

⁵⁸ <https://academic.oup.com/bioscience/article/68/5/336/4966810>

E. Alternative Sites must be Identified and Considered, as well as Alternative Renewable Energy Sources.

The multitude of concerns about the proposed sites for these Projects elevates the need for the state to consider alternative locations for offshore wind development. What alternative sites were considered? We respectfully request a full analysis of alternative sites in state and federal waters to build confidence in siting decisions. As we have repeatedly stated, we feel there are more appropriate sites for floating offshore wind farther offshore. Alternative sources of renewable energy that would provide the identified objectives for local energy resiliency should also be considered, such as distributed solar and storage alternatives.

IV. Conclusion

While we support responsibly sited and operated floating offshore wind power, the proposed Projects raise many environmental and permitting-process concerns for the reasons described within this letter and Attachment A. The Projects are irresponsibly sited in a location with an incredible richness of biodiversity and should not be considered further. These Projects are not in the best interest of the state. The state would be far better served to initiate a planning process to identify appropriate locations for facilities that could be broadly supported by the environmental community and other stakeholders.

California's first offshore wind projects must reflect leasing, siting, and permitting decisions that are guided by planning and comprehensive scientific research on the potential impacts to sensitive marine areas and species and coastal resources, including cumulative impacts. Proper planning must occur before the CSLC considers specific lease applications. Further, developments should reflect recommendations from a robust stakeholder planning process, which will be essential for developing an offshore wind industry that will help power California's clean energy future.

Thank you for your consideration of these comments.

Sincerely,

Kristen Hislop, Marine Conservation Program Director
Environmental Defense Center

Lauren Cullum, Policy Advocate
Sierra Club California

Michael Stocker, Director
Ocean Conservation Research

Pamela Flick, California Program Director
Defenders of Wildlife

(cont'd)

Joel Merriman, Director, Bird-Smart Wind Energy Campaign
American Bird Conservancy

Garry George, Director, Clean Energy Initiative
National Audubon Society

Lisa Belenky, Senior Attorney
Center for Biological Diversity

Sandy Aylesworth, Senior Advocate
Natural Resources Defense Council

Delia Bense-Kang, Northern and Southern CA Regional Coordinator
Surfrider Foundation

Amy Wolfrum, California Ocean Conservation Manager
Monterey Bay Aquarium

Katherine Emery, Executive Director
Santa Barbara Audubon Society

Bruce Schoppe, Conservation Chair
Ventura Audubon Society

Doug Kern, Executive Director
Gaviota Coast Conservancy

Attachment A: March 31, 2021, Letter to Jennifer Lucchesi and Jennifer Mattox, California State Lands Commission

Attachment B: October 21, 2019, Letter to Karen Douglas, California Energy Commission

Cc:

Wade Crowfoot, California's Natural Resources Secretary
Jennifer Lucchesi, California State Lands Commission
Jennifer Mattox, California State Lands Commission
Karen Douglas, California Energy Commission
Mark Gold, California Ocean Protection Council
John Ainsworth, California Coastal Commission
Kate Huckelbridge, California Coastal Commission
Chris Potter, California Department of Fish and Wildlife