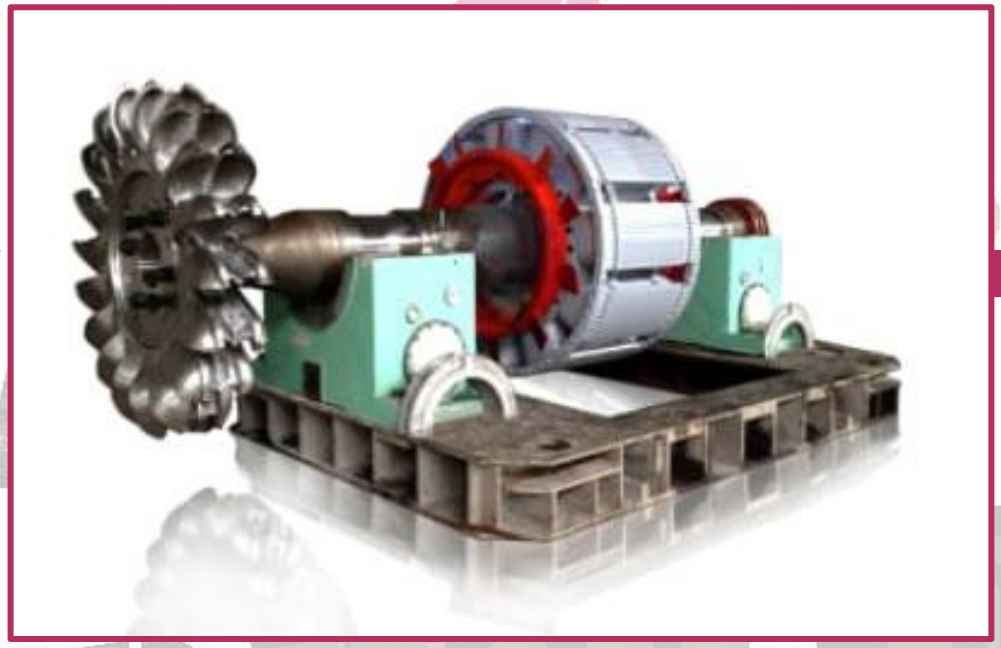

HYDROCELL

HYDROCELL MECHANISM

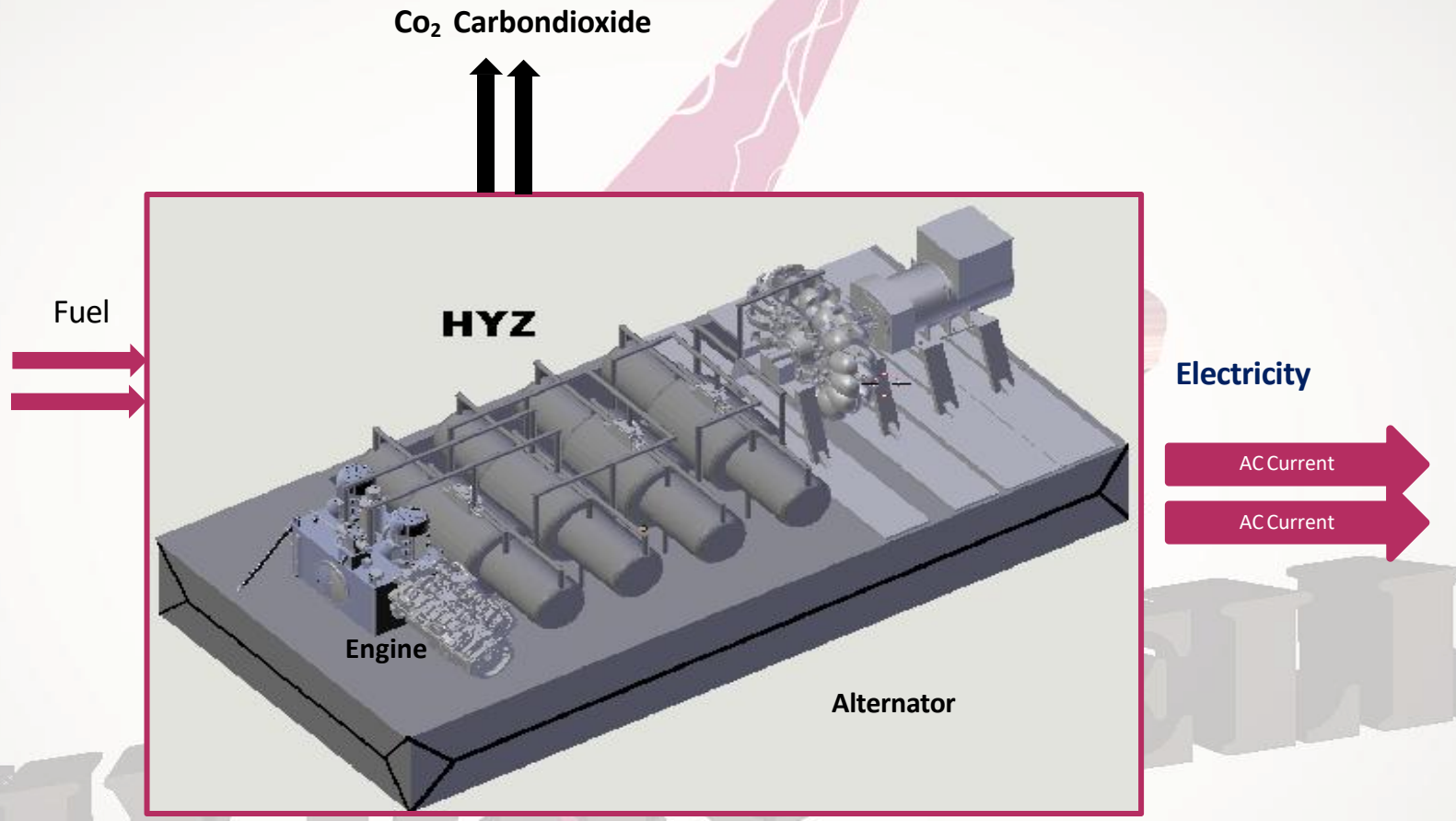


Electricity

AC

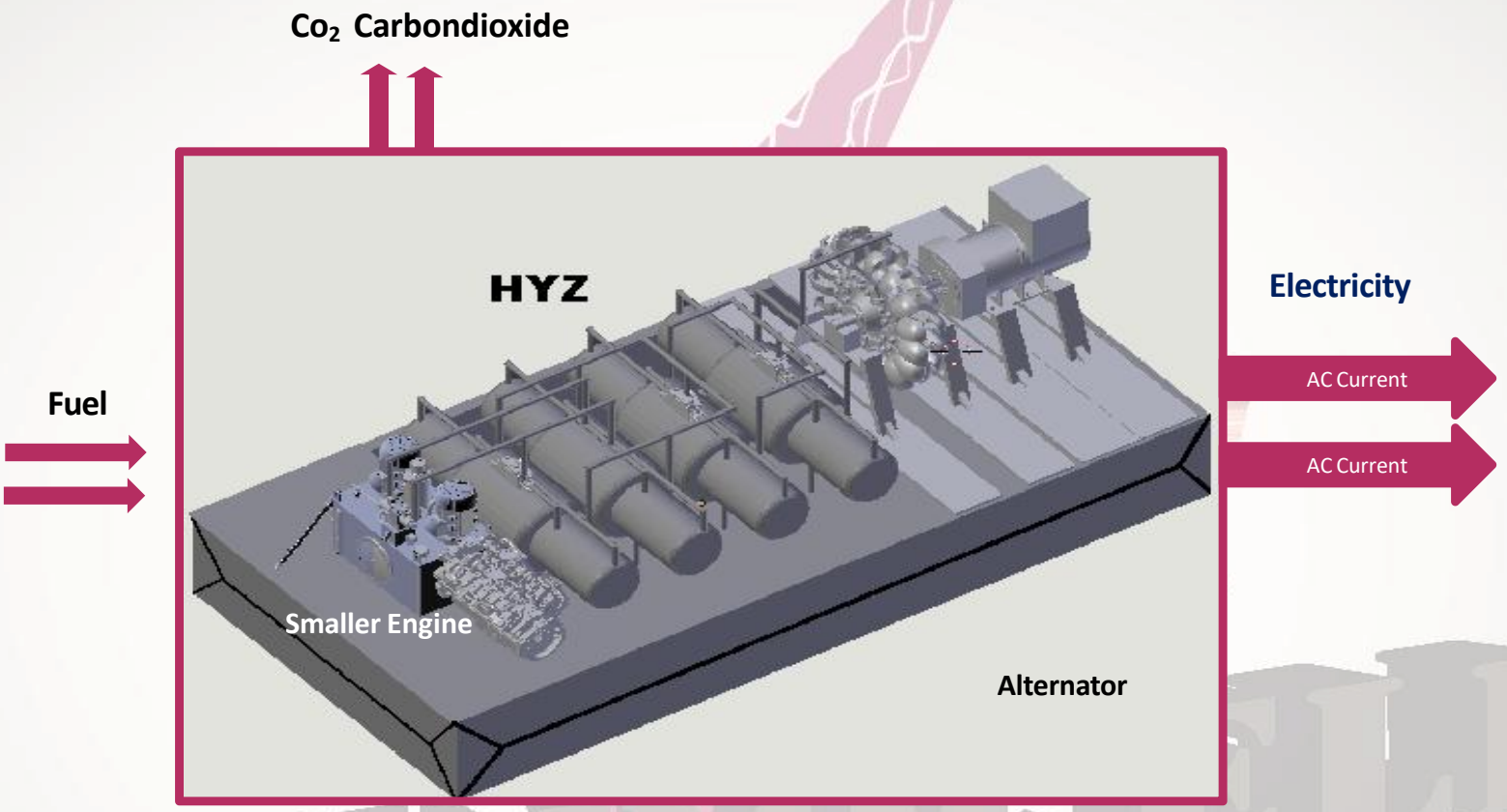
Alternator and Pelton Wheel

Scaling Up Electricity Generation



Standard 100 kw Electricity Generation System

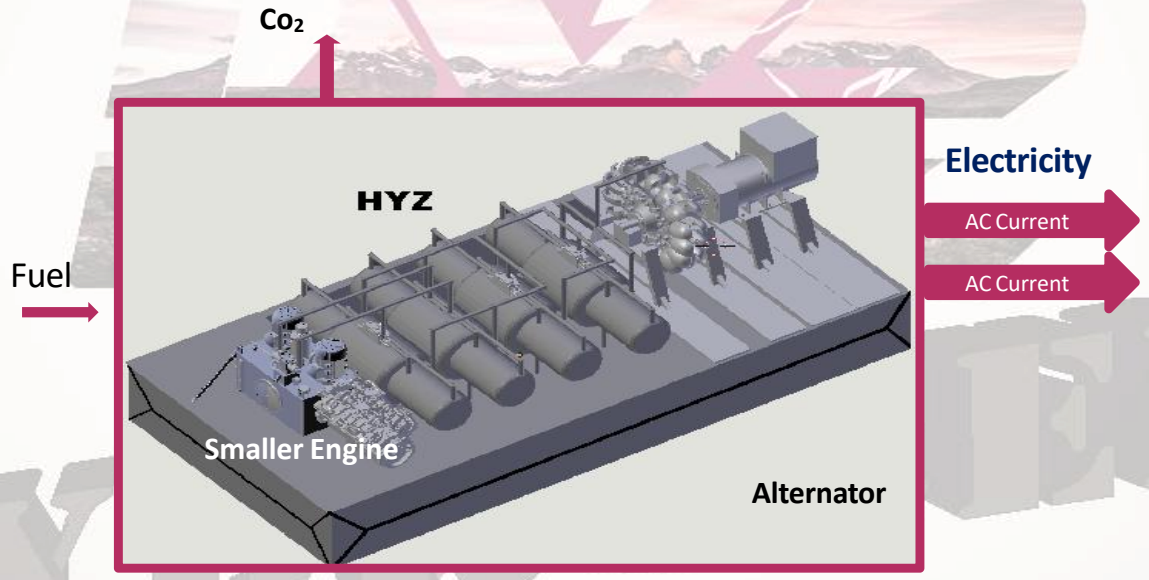
Goal



HYZ invented a portable,endless & renewable source of Generating Electricity (patented in 182 countries) that enables the power of a smaller engine to be converted in to a large huge output inform of water pressure that rotates the pelton wheel which has a shaft connection whith the alternator to generate electricity with significant reduction in fuel consumption

The Project

The Idea of the project is to Produce Portable, Endless, Renewable & High Quality Electricity using standard engines, alternators and other accessories, with HYZ Hydrocell System we are able to produce Electrical Generators from 100 KW (Generators) - 600 MW (Station). Hydrocell system will provide a significant savings in fuel consumption and there will be no production of CO_2 as well.



Potential Savings

Gen Type (KVA)	Diesel consumption l/h	
	Generator	Hydrocell
100	21	3
200	40	4
300	70	5
350	70	5
400	80	5
500	102	6
600	125	9
700	200	16
750	210	16
900	220	18
1000	240	21
1250	260	22

Kahramaa Tarif	QAR per KWH
Industrial (flat)	0.13
Commercial(usage)	0.09-0.18
Residential(usage)	0.08-0.22
Hotels (flat)	0.15
Government (flat)	0.32
Productive Farms(flat)	0.07

Gen Type		QAR per KWH	
(KVA)	KW	**Generator**	Hydrocell
100	80	0.55	0.06
200	160	0.53	0.04
300	240	0.53	0.03
350	280	0.53	0.03
400	320	0.53	0.03
500	400	0.53	0.02
600	480	0.53	0.03
700	560	0.49	0.05
750	600	0.53	0.04
900	720	0.51	0.04
1000	800	0.53	0.04
1250	1000	0.53	0.04

Cost to Kahramaa	**0.15**

Qatar government foots $642m bill for home electricity each year

Electricity prices, March 2019: The chart shows the price of electricity for households in about 100 countries. The prices are per kWh and include all items in the electricity bill such as the distribution and energy cost, various environmental and fuel cost charges and taxes. These are national averages calculated using the average household consumption of electricity in each country. The methodology of price collection is described on the about page.

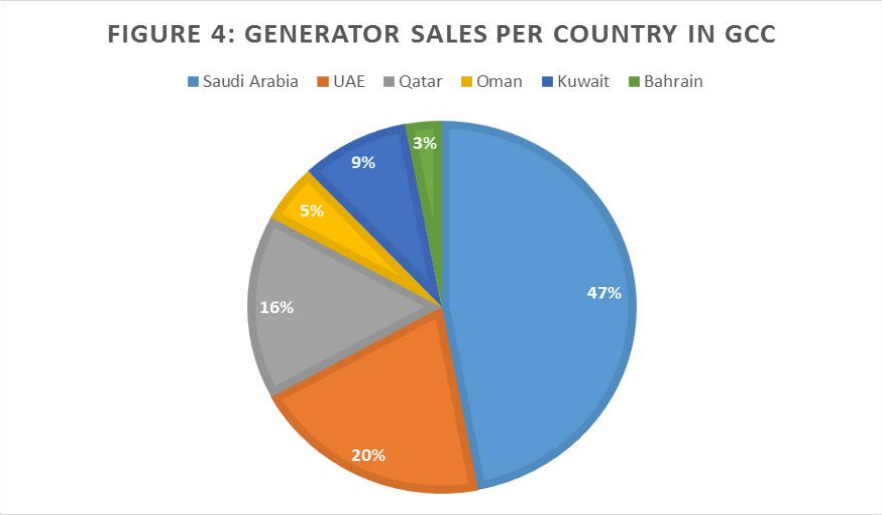
https://www.globalpetrolprices.com/electricity_prices/

Country	Price	Country	Price	Country	Price	Country	Price	Country	Price	Country	Price	Country	Price	Country	Price
Burma	0.02	Ukrain	0.05	Serbia	0.08	Koria	0.10	Colombia	0.15	Singapore	0.18	Uruguay	0.22	Japan	0.29
Qatar	0.03	Georgia	0.06	Cameroon	0.08	Africa	0.11	Malta	0.15	Latvia	0.18	Belize	0.22	Jamacia	0.30
Iraq	0.03	Malaysia	0.06	Mexico	0.08	Canada	0.11	Costa rica	0.15	Slovakia	0.18	Austria	0.22	Belgium	0.32
Egypt	0.03	Bangladesh	0.06	Armenia	0.08	Bulgaria	0.12	Croatia	0.16	slovenia	0.19	Czech	0.23	Denmark	0.34
Iran	0.03	Nigeria	0.07	Argentina	0.09	Thailand	0.12	Lithuania	0.16	Philippines	0.19	UK	0.23	Germany	0.35
kazakhstan	0.04	Tunisia	0.07	Jordan	0.09	Ivory	0.12	Iceland	0.16	France	0.19	Netherland	0.25	Bermuda	0.40
Azerbaijan	0.04	Russia	0.07	Botwana	0.09	Morocco	0.12	Honduras	0.16	Greece	0.19	Spain	0.25		
Algeria	0.04	Vietnam	0.07	Taiwan	0.09	Mozambique	0.12	Estonia	0.17	Finland	0.19	Salvador	0.25		
Zambia	0.04	Sri Lanka	0.08	Turkey	0.09	Hungary	0.13	Senegal	0.17	Aruba	0.20	Australia	0.25		
Ghana	0.05	Macedonia	0.08	Albania	0.10	Namibia	0.13	Romania	0.17	Sweden	0.20	Guatemala	0.25		
Tr&Tobago	0.05	Nepal	0.08	Domin	0.10	Hong Kong	0.14	Poland	0.17	Luxembourg	0.21	Liechtenstein	0.25		
Bahrain	0.05	Belarus	0.08	Ecuador	0.10	Norway	0.14	Israel	0.17	Switzerland	0.21	Barbados	0.26		
Pakistan	0.05	UAE	0.08	Indonesia	0.10	USA	0.14	Chile	0.17	Uganda	0.21	Ireland	0.26		
Saudiarabia	0.05	China	0.08	Tanzania	0.10	Macao	0.15	Panama	0.17	New Zealand	0.21	Italy	0.26		
Afghanistan	0.05	India	0.08	Bosnia	0.10	Kenya	0.15	Brazil	0.18	Peru	0.21	Portugal	0.29		

MARKET ASSESSMENT

Generators market in Qatar and GCC

- The market of generators in Qatar could reach or exceed **QAR 1 billion by 2023**, noting that Qatar generators market is about 16% share of the GCC market
- The sales of generators in the GCC is set to grow from QAR 2.056 billion in 2011 to QAR 2.541 billion in 2015, showing a 23.5 % growth, thus an average of 5.9% yearly. After 2015, The CAGR in units was estimated to be 9% until 2020.
- The GCC has lots of opportunities for the growth of the market for diesel Gensets in the 15-2000 KVA range. KSA has the highest market share in the GCC in the diesel generator market, UAE being the second as per the next figure, and leaving Qatar to be the third country in the region that has a high share (16%) in the market



Qatar Market Drivers

- Qatar has faced a remarkable increase in energy consumption per capita, thus leading to an average annual growth of about 70% in power generation http://www.albawaba.com/business/qatar-looks-renewable-energy-meet-unprecedented-growth-demand-707664.

- The cause of the increasing demand is the rising number of construction and infrastructure projects, mainly caused by the FIFA World Cup that will be held in 2022. Qatar's spending on infrastructure is expected to reach about QAR 637bn over the coming 10 years (2015) http://www.first-qatar.com/data/site1/pdf/Qatar_Market_Outlook_For_2015.pdf

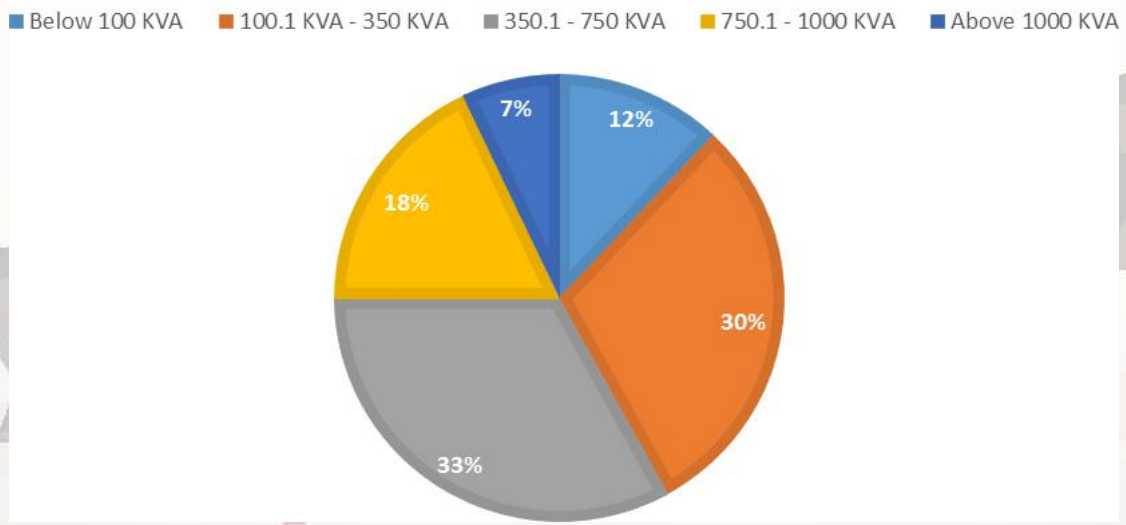
- Within the power rental market, Diesel gensets rental segment constitute the largest portion of the market share but gas powered gensets are forecasted to grow due to increasing demand for power and to environment concerns over diesel related pollution

Market Demand Breakdown

- Diesel generators make up more than 90% of the current market (mostly imports), however, due to environment concerns gasoline powered generators (currently less than 10%) are increasing in popularity

- Diesel generators are more practical to operate and there is a high demand on generators ranging between 100 KVA and 1000 KVA, as shown below

FIGURE 2: QATAR POWER MARKET SHARE BY SIZE, 2020



Market Supplies – Import Data

Import Data for HS Code: 8502; Electric generating sets and rotary converters

Year	2011	2012	2013	2014	2015
Value in QAR (000)	425,612	478,081	505,273	565,838	665,680

- Average growth rate in Genset imports between 2011 and 2015 is about 12%
- Using an average growth rate of 8% moving forward, gives the us the following possible total market

Year	2017	2018	2019	2020	2021	2022	2023
Value in QAR (000)	820,184	852,991	887,111	922,595	959,499	997,879	1,037,794

Market Supplies – Import Data

Import Data for HS Code: 850212 and 850213; Electric generating sets and rotary converters with diesel engine

Year	2011	2012	2013	2014	2015
Value in QAR (000)	214,492	237,655	254,423	330,964	385,049

- Average growth rate in Genset imports between 2011 and 2015 is about 12%
- Using an average growth rate of 8% moving forward, gives the us the following possible total market

Year	2017	2018	2019	2020	2021	2022	2023
Value in QAR (000)	474,419	521,861	563,610	608,699	657,395	683,691	711,038

Target Customers

- The new generator will be marketed as the **primary power Generator** for the following businesses :

  - Manufacturing facilities
  - Construction sites
  - Remote sites
  - Hotels & Resorts
  - Residential compounds
  - Military sites
  - Government buildings and sites

Competitive Advantages

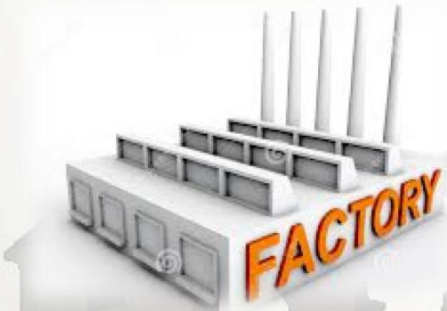
- Financial:
    - Significant reduction in kwh cost even over government cost
    - Minimize fuel consumption cost and logistics to the least
    - Minimize power transportation costs
    - Simple and quick setup
    - Minimize government losses due to electricity subsidies
- Maintenance and Service
    - 24/7 support and service
- Environmental:
    - Co_2 Emission is non at all

Examples Of The Significance of The Savings

HOTEL

Power demand	1000	kw
Annual operations	365	days
daily hours	24	hr/day
Genset diesel	192.77	l/hr
HYZ diesel	22	l/hr

	Annual Cost (QR)		
	Genset	Kahramaa	HYZ Genset
75% load	2,701,864	1,314,000	308,352



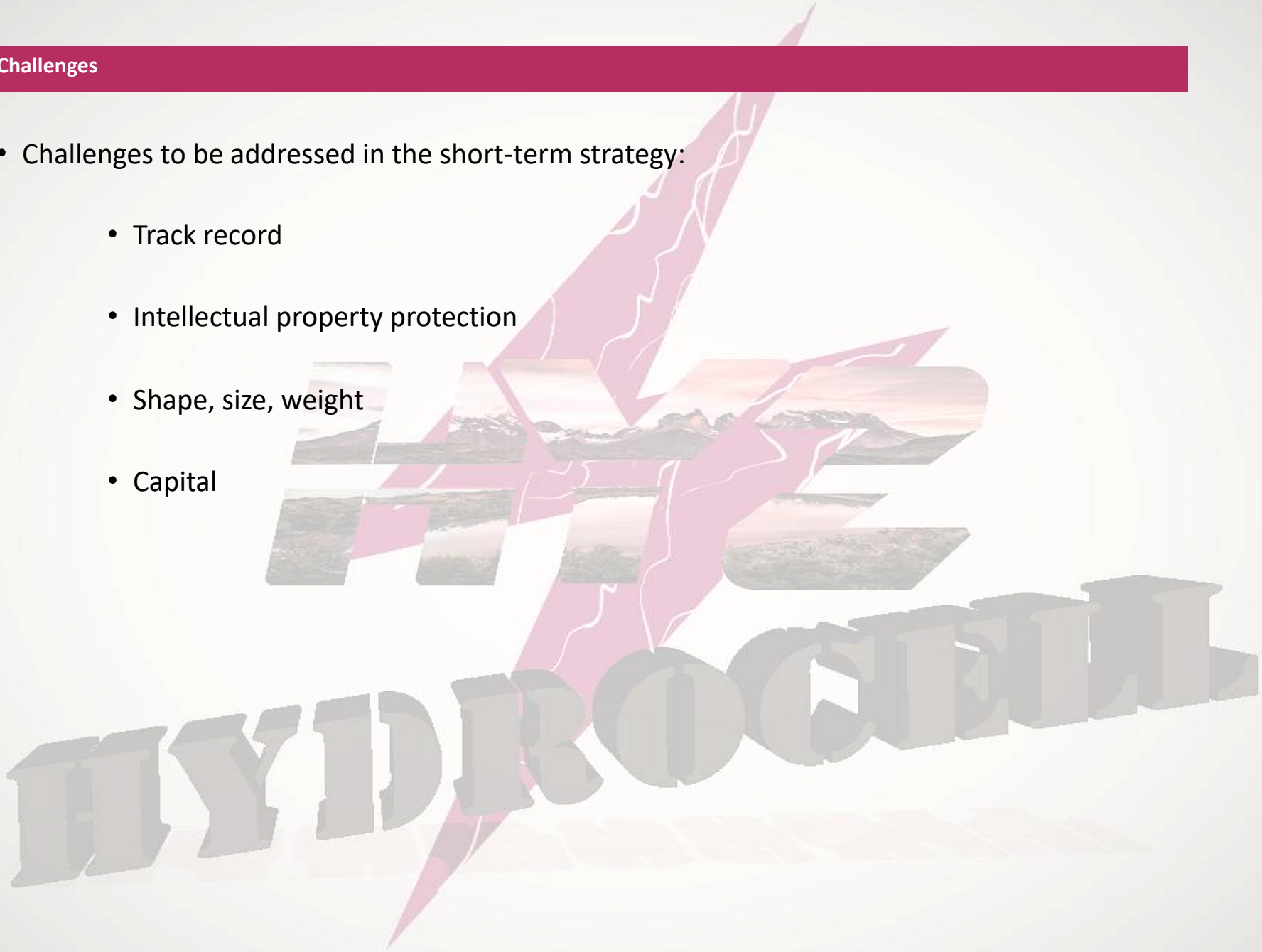
Power demand	500	kw
Annual operations	320	days
daily hours	12	hr/day
Genset diesel	97.68	l/hr
HYZ diesel	6	l/hr

	Annual Cost (QR)		
	Genset	Kahramaa	HYZ Genset
75% load	600,146	249,600	36,864

The produced Generator are not only expected to compete for new projects in Qatar, but also to replace existing Generators, resulting in a potentially much bigger market and higher sales than stated.

Challenges

- Challenges to be addressed in the short-term strategy:
    - Track record
    - Intellectual property protection
    - Shape, size, weight
    - Capital

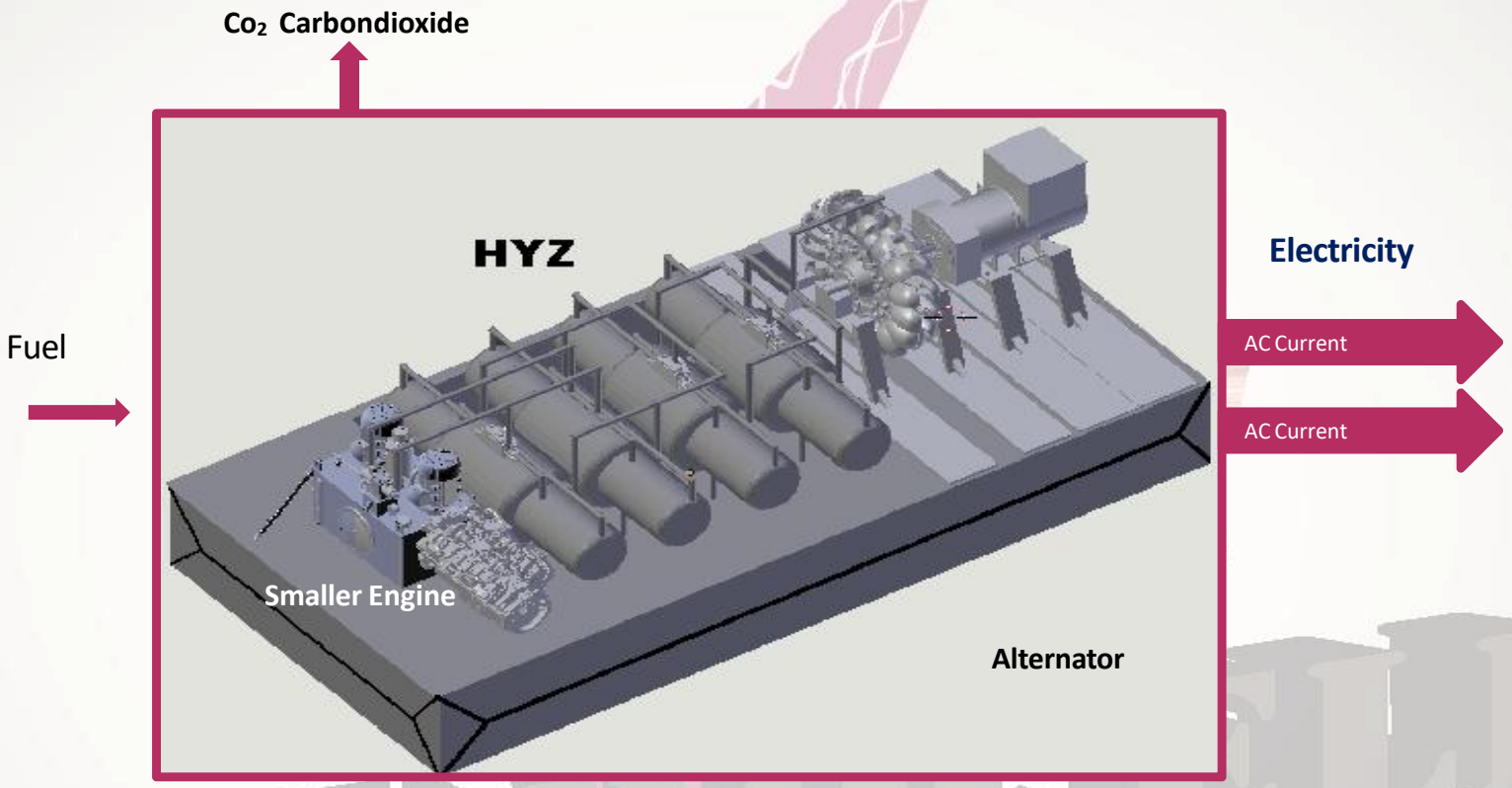


Strategic Actions

2017	2018	2019 & beyond
• Assembled and tested 40 generators • Market rental business • Thorough testing and for all sizes and under different operational and loading conditions	• Rentals and support • Testing and improvements • Secure patent protection • Standards and certifications:	• Generator sales • External markets • Technology licensing

TECHNICAL ASSESSMENT

Goal



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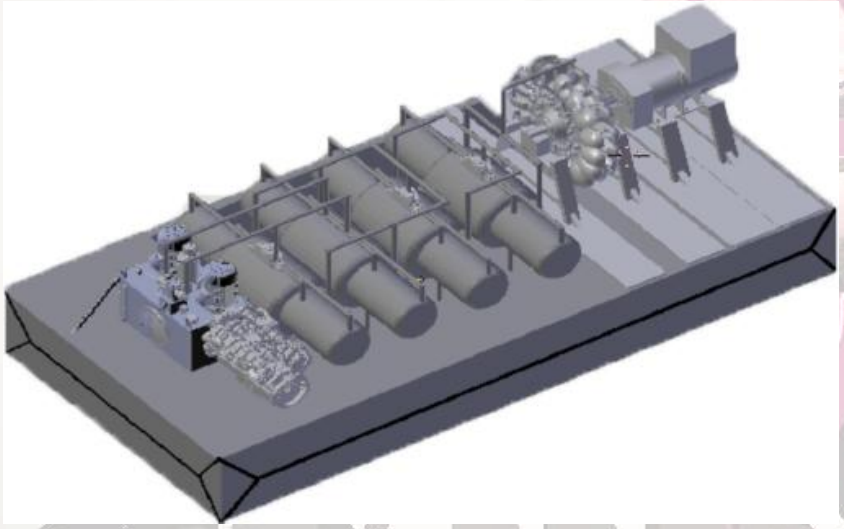
The Project

The manufacturing facility will design and manufacture by HYZ, Generator body, standard engines, alternators, control panels and other accessories. The different parts will be assembled by HYZ



High-end standard parts will be procured

Control Panel

Alternator

Engine

The Nature Of The Proprietary Part

- **Proprietary parts will be designed and assembled in the factory**

- **The technology risk of the newly designed parts is minimum. The parts are purely mechanical made up with basic components.**

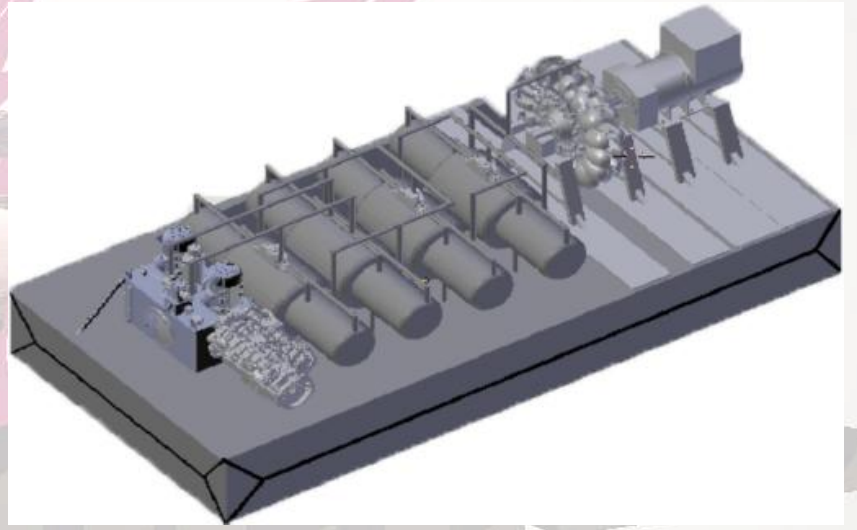
- **The component are manufactured to withstand up to 500% of mechanical loads over the design requirements.**

Proposed Product

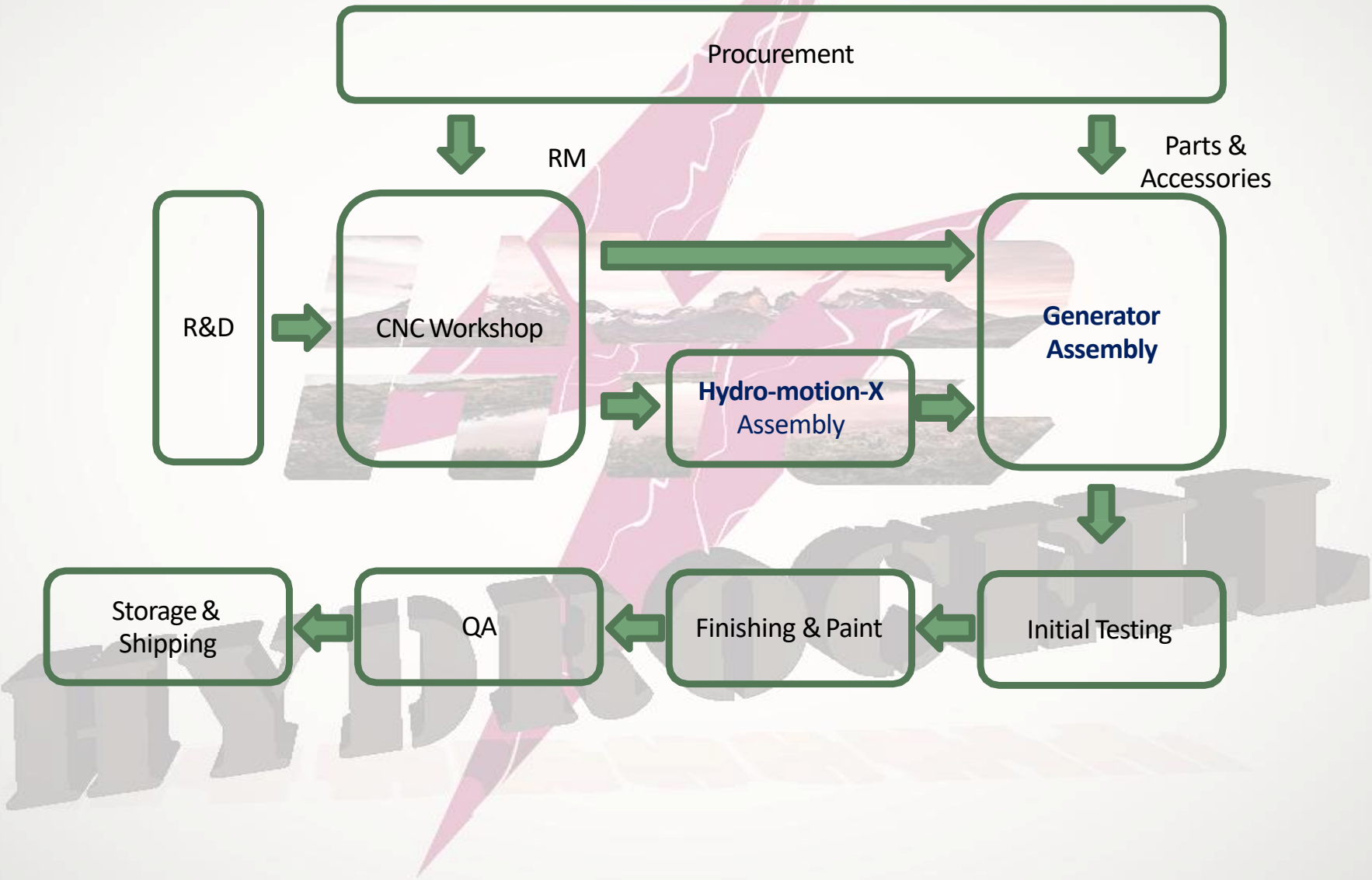
The manufacturing facility will design and manufacture the HYZ system, Genset body, and purchase standard engines, alternators, control panels and other accessories. The different parts will be assembled and labeled as HYZ

Gen Type (KVA)
100
200
300
350
400
500
600
700
750
900
1000
1250

High-end standard parts will be procured

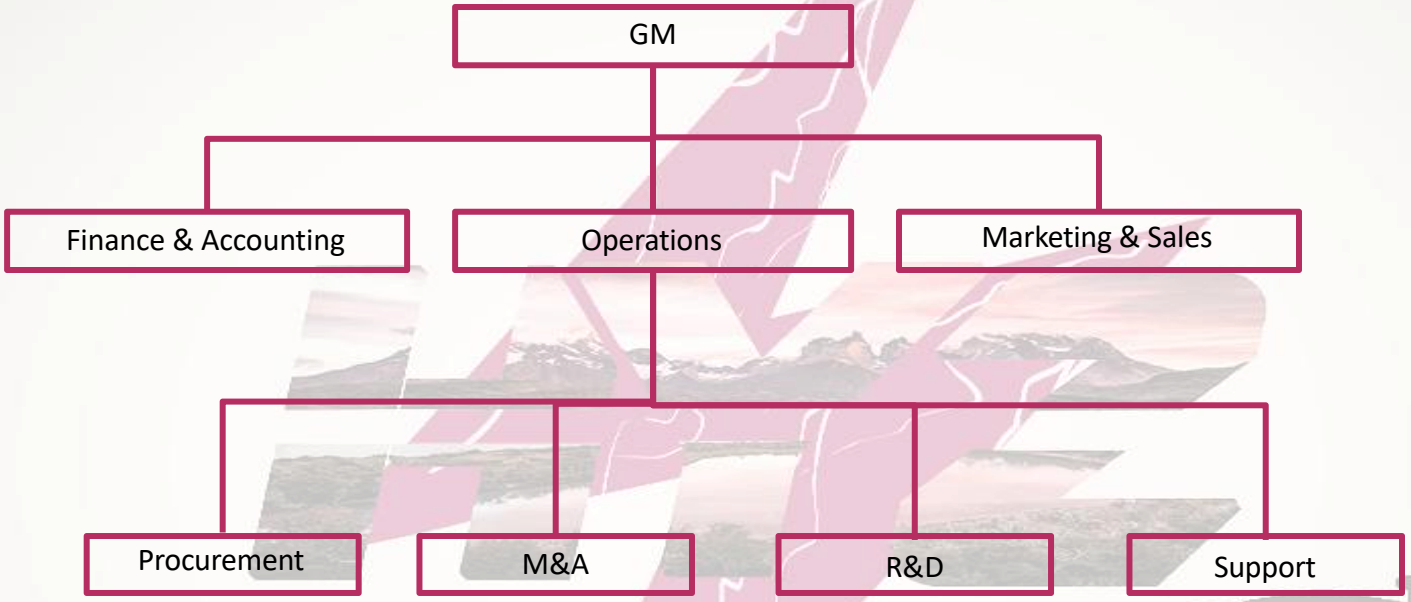


Manufacturing Process



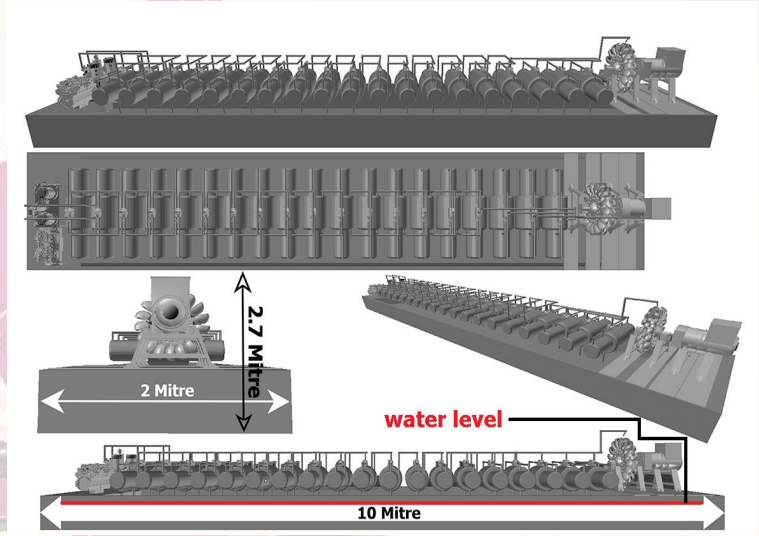
Manpower Assessment

Organisation Structure



Current Status

- Two prototypes were built 250 KVA and 300 KVA
- Tested with real loads (labor camp, industrial loads) for two and a half weeks without any problem.



Standards Compliance and Certification

General:

UL listing (US manufacturing) and CE (European manufacturing)

Specific:

ABGSM Association of British Generating Set Manufactures, BS British Standards Institution, EEC 89/392 Safety and Health, EGSA Electrical Generating Systems Association, IEEE Institute of Electrical and Electronics Engineers (IEEE), IEC International Electro technical Commission (IEC), ISO 9000 International Standards Organization 9000, NEC National Electric Code, NEMA National Electric Manufacturers Association, NFPA National Fire Protection Association (NFPA) and OSHA Occupational Safety and Health Act.

FINANCIAL ASSESSMENT

Rentals and Sales

- Rental price point is higher than current market price (taking the considerations diesel savings).

Description	
Number of generators	40
Working days	360
Rental utilization per year	60%
Weighted rental price per day	1,264
Yearly rental sales	10,920,960

- Sale price point is similar to current market price (to be revisited prior to year2 or 3 depending on market conditions)

Prime Power		Landed Cost (QAR)		Rental Price (QAR)	Rental Sets Remarks
kVA	kW	Open Set	Enclosed	Enclosed	Enclosed
100	80	66,137	78,673	4,000	100 kVA
200	160	89,465	103,347	5,000	200 kVA
300	240	106,141	121,312	6,000	315 kVA
350	280	111,130	132,031	6,000	360 kVA
400	320	183,154	205,143	9,000	500 kVA
500	400	194,332	213,327	9,000	500 kVA
600	480	207,428	226,392	10,000	625 kVA
700	560	309,617	336,564	10,000	800 kVA
750	600	371,471	443,928	10,000	800 kVA
900	720	375,009	444,958	12,000	1000 kVA
1000	800	446,999	523,735	12,000	1000 kVA
1250	1000	670,875	794,927	14,000	1250 kVA

Rentals and Sales

	2018	2019	2020	2021	2022	2023	2024	2025
Sales	10,920,960	24,932,100	75,469,467	152,976,609	310,083,586	380,472,561	390,745,320	401,295,443
Net profit	558,421	5,742,279	27,266,802	60,919,381	130,118,971	161,082,002	165,537,302	170,112,695
Market share of all genset	1%	3%	7%	13%	26%	31%	32%	33%
Market share of diesel genset > 75KVA		5%	13%	25%	47%	56%	55%	55%
Ave number of generators		120	360	720	1440	1728	1728	1728
Utilization	3%	6%	18%	36%	72%	86%	86%	86%

The produced Gensets are not only expected to compete for new projects in Qatar, but also to replace existing Gensets, resulting in a potentially much bigger market and higher sales than stated.

Projected Income Statement

	2018	2019	2020	2021	2022	2023	2024	2025
Currency QR 000								
Total sales	10,921	24,932	75,469	152,977	310,084	380,473	390,745	401,295
COGS	52%	52%	52%	52%	52%	52%	52%	52%
Cost of sales:								
-Materials/packaging/goods	5,724	13,067	39,553	80,174	162,513	199,403	204,787	210,317
-Direct labor	800	1,236	1,697	1,748	1,801	1,855	1,910	1,968
-Other direct	363	744	2,039	3,977	7,906	9,667	9,924	10,189
Cost of sales	6,887	15,047	43,289	85,900	172,220	210,925	216,622	222,474
Gross Margin %	37%	40%	43%	44%	44%	45%	45%	45%
Gross margin	4,034	9,885	32,180	67,077	137,864	169,548	174,123	178,822
Overhead expenses:								
-Selling	443	592	1,108	1,893	3,475	4,190	4,304	4,421
-Management/admin staff	1,082	1,594	2,106	2,559	2,559	2,559	2,559	2,559
-General	1,336	1,341	1,085	1,090	1,096	1,102	1,108	1,114
Depreciation	615	615	615	615	615	615	615	615
Total operating expenses	3,476	4,143	4,914	6,158	7,745	8,466	8,586	8,709
Income from operations	558	5,742	27,267	60,919	130,119	161,082	165,537	170,113
Earnings before interest & taxes	558	5,742	27,267	60,919	130,119	161,082	165,537	170,113
Net income	558	5,742	27,267	60,919	130,119	161,082	165,537	170,113

Investment Requirement

Investment size QR 20 million in exchange for 40% equity in the company:

- For assets purchases (machines, vehicles, RM)
- For working capital
- Other financial obligations

	2018	2019	2020	2021	2022	2023	2024	2025
Cash Flow	245,025	5,121,318	23,528,194	54,738,074	117,060,367	155,067,824	164,989,736	169,788,604
Cash Flow PV	88,809	1,681,970	7,001,861	14,760,557	28,602,989	34,332,983	33,100,540	30,865,619
NPV	(19,911,191)	(18,229,220)	(11,227,359)	3,533,198	32,136,186	66,469,169	99,569,709	130,435,328
ROI	-100%	-91%	-56%	18%	161%	332%	498%	652%
Projected market cap	10,610,008	109,103,297	518,069,243	1,157,468,247	2,472,260,445	3,060,558,044	3,145,208,732	3,232,141,200
Projected Equity share	4,244,003	43,641,319	207,227,697	462,987,299	988,904,178	1,224,223,217	1,258,083,493	1,292,856,480
ROE	21%	218%	1036%	2315%	4945%	6121%	6290%	6464%

- Projected ROI to reach 161% in year5 and 652% in year8
- Projected theoretical payback period is less than 4 years
- The above calculations are done using DCF method and a discount rate of 10.36%

Risks

Risk	Likelihood	Severity	Potential Impact on the Project	Risk Mitigation
Product not performing according to international standards	Low	High	• Could impact the performance of the final product and the success of the project • Could hurt the new brand image	• Thorough testing, characterization and certification during 2017 and 2018 • Limit sales activities to rental only in the first year or two
New component failure	Low	Low	• Inability to sustain operations	• Reconsider marketing and promotion plans • Focus on customer feedback and make proper corrections
Technology theft	Medium to high	Medium	• Reduction in profitability due to potential limited regional and international expansion	• No disclosure of the technology to clients • Rentals limits the client from accessing and reverse engineering the proprietary components • No disclosure of the technology to workers or suppliers
Inventor presence	Low	High	• Difficulties to continue R&D and improvement	• Make sure of a long-lasting partnership with inventor • Thorough documentation • Build a capable R&D team

Hybrid Car Sales

Shifting to the new generator can be faster because the difference in the purchasing factors for a car vs. a generator, for example:

Factor	Generator	Car	Advantages
Reliability	High	High	The new generator is almost the exact same as other high-end brands
Price/Operating cost	High	Med-high	Hybrid cars have higher price and 50% savings in OPEX New generator can be the same price and 90% savings in OPEX
Availability/cost of service	High	High	The same of better
Looks, comfort	Low	High	Generator need to look professional, but nothing out of the ordinary
Exceptional performance	Low	High	As long as the generator meets the requirements
Personal preference	Low	Med-high	Some people like BMW, Mercedes. No such thing for generators