

International Business Development Plan- 2022

2018

RONSHO

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Sigma Renewables

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Investing for a better future.

Sigma Renewables

Company profile:

Company name: Sigma Renewables

Headquarters: Shlomo Ibn Gabirol St 129, Tel Aviv-Yafo, 62039, Israel

Our other business locations at:

Nairobi, Kenya.

Ljubljana, Slovenia.

Tashkent, Uzbekistan.

Kigali, Rwanda.

Mission:

“The mission is to establish Sigma Renewables as a responsible brand that believes in creating a better future, by adopting green/ renewable technology for energy generation and enriching the lives of people by connecting them with energy supply.”

Vision:

“The company is committed to implementing the latest renewable energy-producing alternatives across the globe, to ensure a continuous supply of greener energy.”

Investment Objectives

It is expected to make direct investments on projects in Kenya, Slovenia, Uzbekistan, and Rwanda up to USD 85 M focused on the Energy industry in several forms.

Kenya: Garba Tula solar park.

Slovenia: Krško micro-reactor nuclear project.

Uzbekistan: Uzbek Sunrise Solar Project.

Rwanda: Solar House System.

The company is very optimistic about its analysis and estimates an average payback of the investment in 5 years

Investment allocation:

Countries	Investment allocation (%)	USD \$
Slovenia	30%	25 m
Kenya	28%	23 m
Uzbekistan	24%	20 m
Rwanda	18%	15 m

Total= 83 m. USD

Project- Krško micro-reactor nuclear project, Slovenia

Project breakdown analysis:

- According to the IEA, Slovenia has put in place a national renewable action plan in the year 2020, which targets a 25% share of energy generation from renewable sources in final energy consumption and the 39% of electricity demand met by electricity generated from renewable energy sources. (IEA,2022)
- Slovenia has achieved its goal of a 25% share of energy from renewable sources to support the EU's 2030 target for renewable energy adoption, Slovenia has plans to increase the total energy share by 37% from renewable sources.

From here we see two options for investment.

1. Hydroelectricity project
2. Nuclear reactor project

- **Hydro-energy projects** can be classified into:

- o Micro- up to 100KW
- o Mini- 101 KW to 2MW
- o Small- 2MW to 25MW
- o Large- More than 30MW
- o Mega- More than 500MW

Further, a report published by Stanford highlights the following calculations:

The basic cost of a hydro project = 1 million/1MW
= 100 MW * 1 million
= 100 million USD

Maintenance cost (annual) = \$10-18/KW

So, if you have a 100 MW project:

1MW = 1000KW

100MW = 100000 KW

Considering 15\$ as the average cost per KW, then:

100000 KW * 15\$
= 1500000 USD/Year

Analysis:

After my thorough analysis and after studying several hydropower case studies like the Sardar Sarovar Dam in India, Nyabarongo 1 power station in Rwanda, and many more. It is suggested that a minimum of 25 MW of the project should be installed and if not, the option should be left.

▪ **Nuclear Projects:**

Construction cost (average) = 3000\$/KW
1MW = 1000KW

Therefore, the cost of the 1MW project will be 3 million \$ USD.

Merits: These projects are highly scalable and can be a game changer in the target of achieving net zero.

Demerits: Huge cost of implementation, longer construction phases, and most important higher valuation in the estimated vs the final cost of the project.

▪ **Cost analysis of a micro-reactor:**

Advanced nuclear reactor = \$5366 for 1KW of capacity.

If the goal is to make a 5MW project:

5MW= 5000KW

Cost= \$5366 * 5000KW → 2,683,0000 USD

▪ **Maintenance of the reactor:**

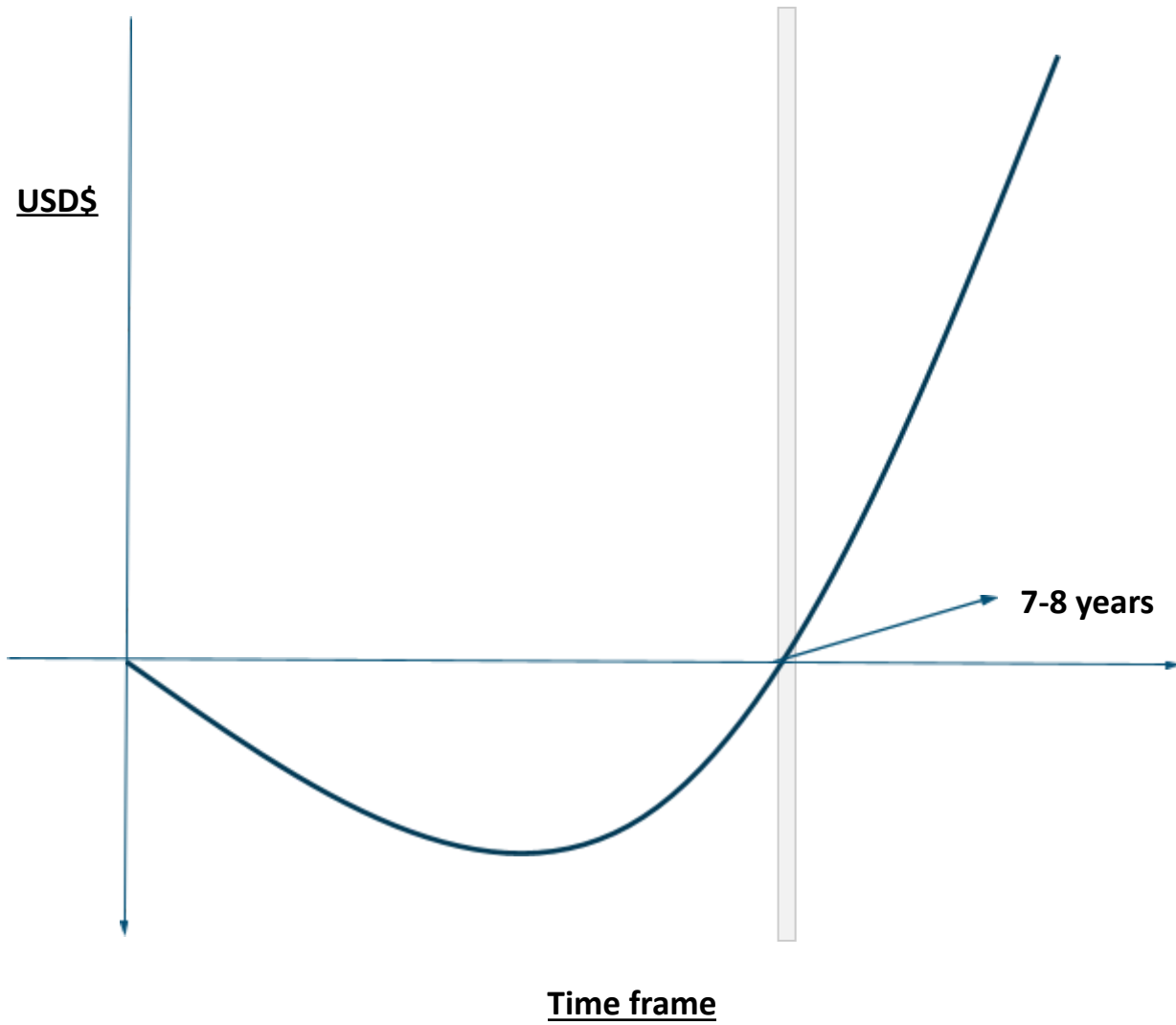
Considering the reactor size to be 5MW= 5000KW

Standard cost = 1.98\$/watt

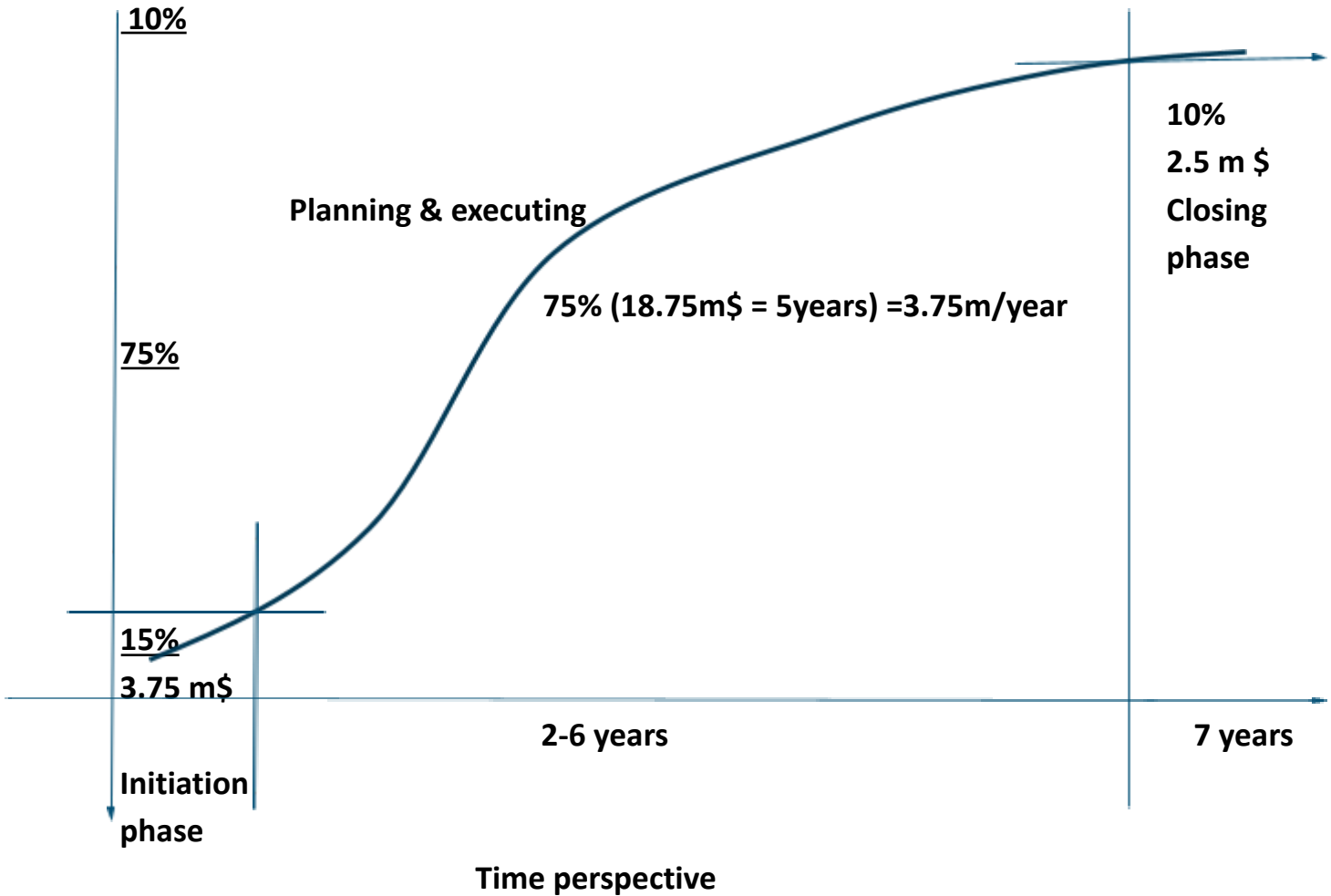
5000 KW = 500000W

500000W * 1.98\$/watt = 9,90,000\$

Process life cycle:



Project life-cycle- “s” curve:



Project life-cycle- “s” curve analysis:

	Initiation Phase	Planning			Closing		Total
	2023	2024	2025	2026	2027		
Baseline (weight%)	15%	25%	25%	25%	10%		100%
Budget	3,750,000	6,250,000	6,250,000	6,250,000	2,500,000		25,000,000
Time Perspective	12 months	36 months			12 months		5 years

Payback and Cashflows:

NPV=	Cash flow/ (1+discount)^yr	NPV at Year 10	\$ 2,60,30,557.38
		Payback Year	7
Discount	8%	Cumulative value on payback year	\$ 6,58,215.31
		NPV at Payback	\$ 60,57,190.45
		Payback =	Payback year - (Cumulative value/NPV)
		PAYBACK (years)	6.891333232

Year	Cash Flow	NPV	Cumulative	
0	\$ (2,50,00,000.00)	\$ (2,50,00,000.00)		
1	\$ 39,10,000.00	\$ 36,20,370.37	\$ (2,13,79,629.63)	CONTINUE
2	\$ 56,10,000.00	\$ 48,09,670.78	\$ (1,65,69,958.85)	CONTINUE
3	\$ 68,50,000.00	\$ 54,37,750.85	\$ (1,11,32,208.00)	CONTINUE
4	\$ 78,00,000.00	\$ 57,33,232.85	\$ (53,98,975.14)	CONTINUE
5	\$ 89,00,000.00	\$ 60,57,190.45	\$ 6,58,215.31	CALCULATE PAYBACK
6	\$ 1,20,90,000.00	\$ 76,18,750.79	\$ 82,76,966.10	CALCULATE PAYBACK
7	\$ 1,35,00,000.00	\$ 78,77,120.34	\$ 1,61,54,086.43	CALCULATE PAYBACK
8	\$ 1,14,00,000.00	\$ 61,59,065.28	\$ 2,23,13,151.72	CALCULATE PAYBACK
9	\$ 53,20,000.00	\$ 26,61,324.51	\$ 2,49,74,476.22	CALCULATE PAYBACK
10	\$ 22,80,000.00	\$ 10,56,081.15	\$ 2,60,30,557.38	CALCULATE PAYBACK

Discounted cash flows:

NPV=	Cash flow/ (1+discount)^yr	Payback Year	7
		Cumulative value on payback year	\$ 42,72,043.37
Discount	15%	NPV	\$ 50,37,556.33
		Payback =	Payback year - (Cumulative value/NPV)
		DISCOUNTED PAYBACK (years)	6.151961172
		IRR	25%

Year	Cash Flow	NPV	Discount (15%)	Cumulative	
0	\$ (2,50,00,000.00)	\$ (2,50,00,000.00)	1		
1	\$ 35,50,000.00	\$ 30,86,956.52	0.869565217	\$ (2,19,13,043.48)	CONTINUE
2	\$ 57,00,000.00	\$ 43,10,018.90	0.756143667	\$ (1,76,03,024.57)	CONTINUE
3	\$ 65,00,000.00	\$ 42,73,855.51	0.657516232	\$ (1,33,29,169.06)	CONTINUE
4	\$ 78,00,000.00	\$ 44,59,675.32	0.571753246	\$ (88,69,493.75)	CONTINUE
5	\$ 83,00,000.00	\$ 41,26,566.90	0.497176735	\$ (47,42,926.85)	CONTINUE
6	\$ 92,00,000.00	\$ 39,77,413.88	0.432327596	\$ (7,65,512.96)	CONTINUE
7	\$ 1,34,00,000.00	\$ 50,37,556.33	0.37593704	\$ 42,72,043.37	CALCULATE PAYBACK
8	\$ 1,50,00,000.00	\$ 49,03,526.61	0.326901774	\$ 91,75,569.98	CALCULATE PAYBACK
9	\$ 95,00,000.00	\$ 27,00,492.91	0.284262412	\$ 1,18,76,062.89	CALCULATE PAYBACK
10	\$ 47,50,000.00	\$ 11,74,127.35	0.247184706	\$ 1,30,50,190.25	CALCULATE PAYBACK

Profitability Index:

NPV = Profitability Index

Invst.

= $\frac{16154086}{25000000} = 0.64\%$ or 64%

Results of the financial analysis:

Method	Results	Accept/Reject
NPV	16154086	Accept
Payback	6.89 years	Accept
Disc. Payback	6.15 years	Accept
Profitability index	0.64%	Accept

Therefore, it is suggested that Sigma renewables can go forward with its investments in micro-nuclear reactors @ the Krško nuclear power plant in Slovenia, and reject the hydro project because it is time intensive.

Allocation of Investment:

1. **Slovenia (25%):** According to the international trade administration of the United States, which claims that Slovenia is taking big leaps in the field of developing low-carbon energy alternatives. The government is aggressively designing plans to develop new hydro and nuclear energy projects. Slovenia also takes the responsibility to share a major amount of carbon-free energy-producing load of 37% to meet the goals of the European Union. The Slovenian regime is ready to spend and provide financial support ranging from 600 million euros to 2.5 billion euros in the development of such carbon-free energy-producing alternatives. (ITA,2022)

Looking at the current energy crisis across Europe due to the geopolitical conflict, it has become a matter of the emergence of alternative energy sources and the importance of being self-reliant in terms of meeting local energy demands. Looking into this the country has great potential in becoming the backbone of the European carbon-free energy-producing mission. (WEF,2022)

Business and investment type:

1. **Slovenia**

Business- **Developing micro nuclear reactors, Joint venture with the GEN Energija company.**

Type of investment: **Direct brownfield/ Horizontal integration.**

Why invest in Slovenia:

The following is the decision-making matrix for justifying the decision for Slovenia:

<u>Criteria</u>	<u>Investment worthiness</u>
Market size	Medium (4.8 billion \$)
FDI	Low (101.11 m euros)
Forex/Foreign reserve	Medium (780 m euros)
GDP	Low (63.60 billion \$)
Debt to GDP	74.70%
Political Stability	High
Payback & cashflow	6.89 years
Country credit rating (post-COVID-19)	AA- (by S&P rating)
Corruption perception index	61/100 (score) Rank: 34 th

Strategic Analysis of Slovenia:

1. SWOT ANALYSIS:

Strengths (internal)	Weaknesses (internal)
1. Strong grid system network across the nation. 2. Slovenia has been successful in scaling renewable energy projects. 3. Lowest per-unit energy prices across the European Union. 4. Stable regime, Low corruption, and necessary support from the European Union.	1. Geographic location, because it has a small coastline and the majority of the land is occupied by forest. 2. Non-availability of natural resources like crude, gas, and uranium. 3. No proactive efforts were made to make the nation energy-rich, still today Slovenia is heavily dependent on exports. This indicates the insufficiency of the previous governments in policy making.
Opportunities (external)	Threats (external)
1. Due to cost-effective energy production, the country has a good scope of exporting to neighboring countries. 2. Develop policies that promote private players to increase their contribution to the industry. 3. Europe is highly optimistic about clean and renewable energy; this will allow the country to increase its capacity to many folds by developing new and large-scale projects with the help of the Union.	1. Over 50% of the country's land is covered by forest reserves, such large projects may or mostly impact the environment adversely. 2. Generally, there is a huge variance between the estimated project cost (on paper) and the actual on-ground cost incurred. The same rule applies to the time frame to implement such projects. (

2. PESTLE ANALYSIS:

Political Factors	Economic Factors
Slovenia as a nation follows the democratic parliamentary structure, where individuals have the right to elect their representatives. Being a part of the EU freedom is something that has always been appreciated, may it be freedom of speech, or practices.	Covid-19 had many adverse effects on the Slovenian economy, as it experienced a sharp decline in demand, a depreciating value of the euro, rising inflation, and prime rates. Labor market imperfections have always been a major hurdle across western countries. Despite all the challenges, Slovenia is still committed to the goals of the European Union.
Sociocultural Factors	Technological Factors
Slovenia has a polycentric culture, which means a Slovenian will go out of his natural behavior to mirror the other person. A similar culture is also experienced at workplaces.	Slovenia has allotted a budget of 6 billion euros for the development of alternative energy-producing sources, this will further foster R&D and innovation in the field. Adoption of advanced technologies like the micro nuclear reactor will further support efficient energy production in the country. (NEI, 2022)
Environmental Factors	Legal Factors
Europe and its nations are highly committed to preserving nature and biodiversity. In the past few years, efforts have become more aggressive in adopting carbon-free technologies. This is one of the prime reasons why Slovenia is highly focused on increasing its capabilities in this sector.	Generally, the business environment is 100% open for everyone including the FDI, but in some exceptional cases like nuclear and other projects have to be permitted by the government, and a local partner is required.

3. Porter's Five force:

The threat of new Entrants	Threats of Substitute products
Limited or contained in this industry or project because of its nature i.e., capital and time intensive. Even though there are certain barriers to entry such as licensing, permits, and partnerships with the local business.	Right now, there are no close substitutes to a renewable source of energy, but among the alternatives, there are different options like wind, and solar, which are still not yet explored in the nation.
Bargaining power of Suppliers	Bargaining power of buyers
The number of suppliers in the market is very less as a result the bargaining power increases. Companies like Holding Slovenske Elektrarne and GEN Energija are the major players in the industry.	The population growth rate is almost negligible, so here the bargaining power of the consumer will be less, this makes the Slovenian market a perfect destination to make an investment in any industry.
Rivalry among existing firms	
There is no such stiff rivalry in the market particularly in carbon-free energy production, because HSE- looks after thermal and hydro projects, whereas GEN Energija looks after the nuclear projects, in this way the competition is contained or in a way eliminated due to the monopolism in the market.	

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