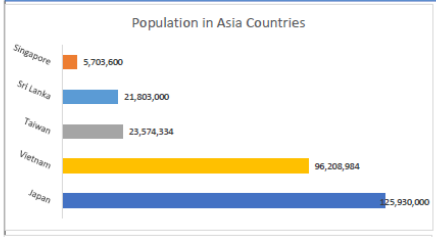
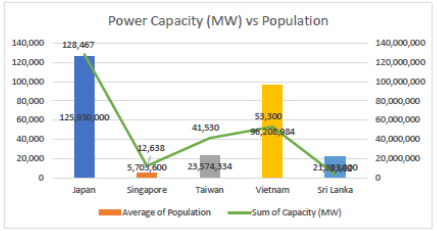
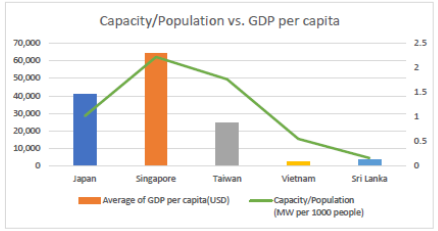
Step into Next Country

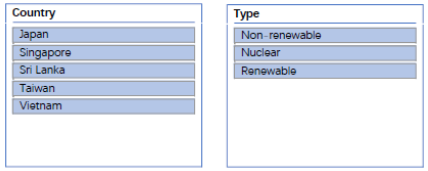
Exploring a potential market in a new country by data analysis

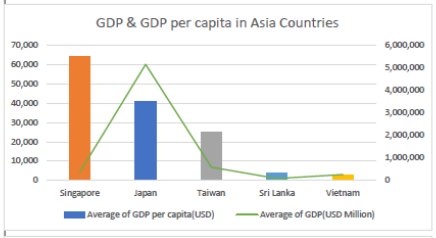
Power Infrastructure Market Analysis in Asia

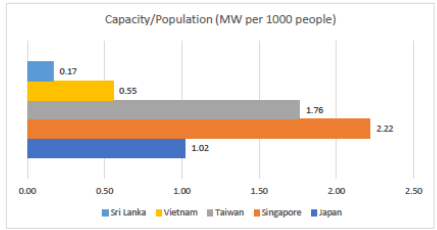


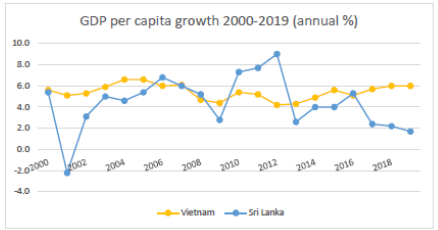


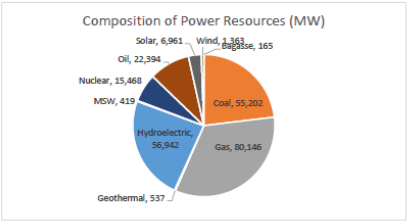


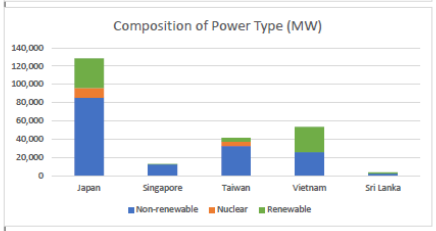


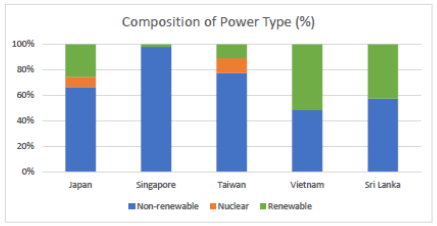


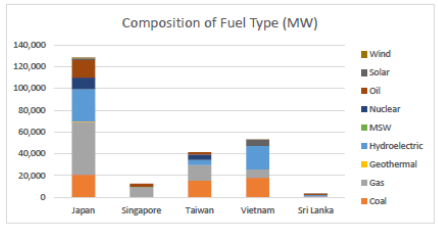


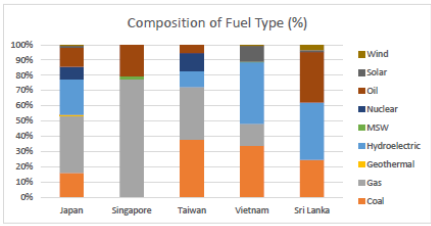












Content

1. Problem Definition
2. Data Collection
3. Data Preparation
4. Data Analysis & Visualization
5. Findings
6. Conclusion
7. Q & A

Problem Definition

Business Scenario:

As a regional infrastructure construction company, my former employer plays an important role in Power Station Construction in Singapore, Malaysia, and Indonesia.

Since the power grid in these 3 countries are highly developed, there will not be many new projects in future.

So as marketing team, we would like to explore the **Market Potential** in South Asian Countries in Power Infrastructure.

Problem:

To explore potential market in a new country.

=>Potential Market = Demand is not fully met

=>Existing Power Generating Capacity is below Demand

=>Which Country facing Shortage of Power Generating Capacity? <=Problem to solve

Data Collection

Problem:

Which Country facing Shortage of Power Generating Capacity?

=> What are the data to look for to solve this problem?

=>Existing Power Generating Capacity in respective countries.

Data Resource:

Wikipedia- *Lists of power stations*: https://en.wikipedia.org/wiki/Lists_of_power_stations

Data Collection

Data Resource:

Wikipedia- *Lists of power stations*: https://en.wikipedia.org/wiki/Lists_of_power_stations

List of power stations in Singapore

From Wikipedia, the free encyclopedia

The majority of electricity in Singapore comes from natural gas power plants.

Contents [hide]

1 List by fuel
- 1.1 Oil-fired Thermal
- 1.2 Gas
- 1.3 Waste to energy

2 See also

3 References

Location of power stations in Singapore. Oil, Gas, Waste

List by fuel [edit]

Oil-fired Thermal [edit]

Name	Location	Capacity (MW)	Commissioned	Owner	Type	Refs
Senoko Power Station		500	1983	Senoko Energy Pte Ltd	Oil	[1]
Tuas Power Station		600	1999	Tuas Power Ltd	Oil	[2]
Pulau Seraya Power Station		1500	1987-1992	YTL PowerSeraya Pte Ltd	Oil	[3]

Gas [edit]

Name	Location	Capacity (MW)	Commissioned	Owner	Type	Refs
PacificLight Power		800	2014	PacificLight Power Pte Ltd	LNG	[4]
SembCorp Cogen @ Banyan		400	2014	SembCorp Cogen Pte Ltd	NG, cogen	[5]

Data Collection

Data Resource:

Wikipedia- *Lists of power stations*: https://en.wikipedia.org/wiki/Lists_of_power_stations

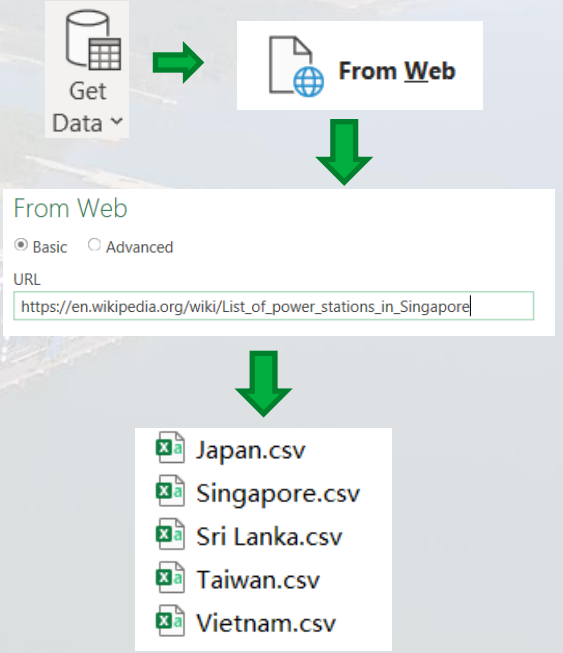
Countries to look for data:

1. Developed Country/Region: Singapore, Japan, Taiwan
2. Developing Country: Vietnam, Sri Lanka

Metrics to look for:

1. Population
2. GDP & GDP per capita
3. Existing Power Station Name;
4. Existing Power Station Country;
5. Existing Power Station Capacity;(MW=Mega Watt)
6. Existing Energy Type;(Non-Renewable/Renewable/Nuclear)
7. Existing Fuel Type;(Oil/Gas/Coal/Wind/Hydro/Solar etc.)

Data Collection Procedure



Data Preparation

Singapore

Name	Location	Capacity (MW)	Commissioned	Owner	Type	Refs
Senoko Power Station		500	1983	Senoko Energy Pte Ltd	Oil	[1]

Taiwan

Station	Chinese	Location	Coordinates	Capacity (MW)	Notes
Hoping Power Plant[3]	和平電廠	Xiulin, Hualien	24°18′24″N 121°45′50″E	1,320	

Japan

Station	Location	Coordinates	Capacity (MW)	Fuel type	Year	Status	Refs
Hekinan (碧南火力発電所)[1]	Aichi	34°50′01″N 136°57′44″E	4,100	Coal			[2][3]

Sri Lanka

Station	Region	Water source	Location	Capacity (MW)	Commissioned	Notes	Ref
Victoria	Mahaweli	Victoria	07°12′00″N 80°48′21″E	210	October 1984		[2][3][16]

Vietnam

Station	Province	Capacity (MW)	Commission date	Sponsor/Owner	Status	Note	Ref
Ca Mau 1&2 gas power plant	Ca Mau	2x750	2008	PetroVietnam Power Ca Mau	Operating		[45] and decision 125/QD-DTDL annex 3 row 22-23

Data Preparation

Master List-List of Power Stations in Asia

A	B	C	D	E	F	G	H	I	J
Station	Country	GDP(USD Million)	Population	GDP per c	Location	Capacity (MW)	Fuel Type	Type	Year
Jinshan Nuclear Power Plant	Taiwan	586,104	23,574,334	24,827	Shimen, New Taipei	1208	Nuclear	Nuclear	
Kuosheng Nuclear Power Plant	Taiwan	586,104	23,574,334	24,827	Wanli, New Taipei	1896	Nuclear	Nuclear	
Maanshan Nuclear Power Plant	Taiwan	586,104	23,574,334	24,827	Hengchun, Pingtung	1780	Nuclear	Nuclear	
Genkai Nuclear Power Plant (玄海原子力発電所)	Japan	5,154,475	125,930,000	40,846	Saga	3478	Nuclear	Nuclear	
Ikata Nuclear Power Plant (伊方発電所)	Japan	5,154,475	125,930,000	40,846	Ehime	2022	Nuclear	Nuclear	
Sendai Nuclear Power Plant (川内原子力発電所)	Japan	5,154,475	125,930,000	40,846	Kagoshima	1780	Nuclear	Nuclear	
Takahama Nuclear Power Plant (高浜原子力発電所	Japan	5,154,475	125,930,000	40,846	Fukui	3304	Nuclear	Nuclear	
Keppel Seghers Tuas Waste-to-Energy Plant	Singapore	362,818	5,703,600	63,987		22	MSW	Renewable	2009
Senoko Incineration Plant	Singapore	362,818	5,703,600	63,987		55	MSW	Renewable	1993
Tuas Incineration Plant	Singapore	362,818	5,703,600	63,987		47.8	MSW	Renewable	1987
Tuas South Incineration Plant	Singapore	362,818	5,703,600	63,987		132	MSW	Renewable	2000
KCP - Phu Yen Phase 1	Vietnam	261,637	96,208,984	2,740	Phu Yen	30	Bagasse	Non-renewable	2017
Tuyen Quang	Vietnam	261,637	96,208,984	2,740	Tuyen Quang	25	Bagasse	Non-renewable	2019
An Khe	Vietnam	261,637	96,208,984	2,740	Gia Lai	110	Bagasse	Non-renewable	2017
Go Cat	Vietnam	261,637	96,208,984	2,740	Ho Chi Minh City	2.5	MSW	Non-renewable	2017
Can Tho	Vietnam	261,637	96,208,984	2,740	Can Tho	7.5	MSW	Non-renewable	2018
Nam Son	Vietnam	261,637	96,208,984	2,740	Hanoi	2	MSW	Non-renewable	2017
Sugar mills	Vietnam	261,637	96,208,984	2,740		150	MSW	Non-renewable	

Data Analysis & Visualization

Question Analyzed:

1. What are the Population Distribution among these 5 countries?
2. What are the respective GDP & GDP per capita in these 5 countries? Which one could represent the Development Level of a country?
3. Does individual citizen have enough power supply? What is the Occupancy Rate of Power Generating Capacity for individual?
4. As Vietnam & Sri Lanka are still developing countries, currently they might not need as much Power Generating Rate as developed countries with respect to their Development Level. So, are they really in shortage of Power Generating Capacity in this stage? Which one has more market potential?
5. Is Sri Lanka developing well compared to Vietnam? What are their annual growth rate in GDP per capita?

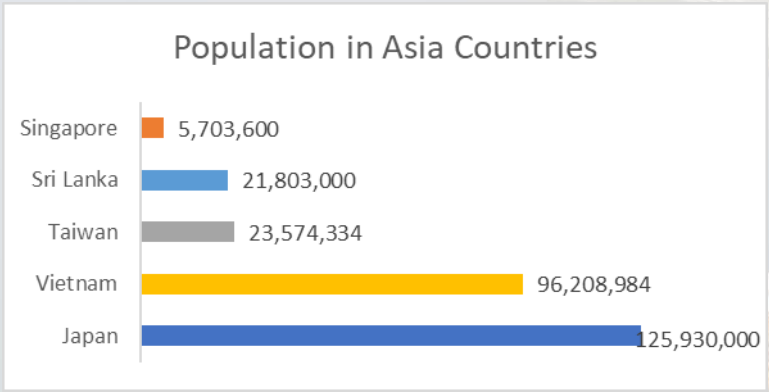
=>Problem Solved

Findings

Which Country facing Shortage of Power Generating Capacity?

Question: 1. What are the Population Distribution among this 5 countries?

Answer:



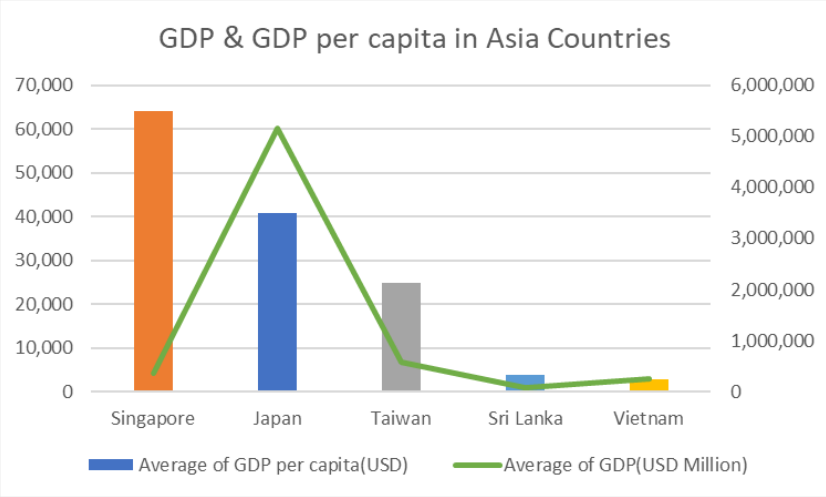
Country	Population
Japan	125930000
Vietnam	96208984
Taiwan	23574334
Sri Lanka	21803000
Singapore	5703600

Findings

Which Country facing Shortage of Power Generating Capacity?

Question: 2. What are the respective GDP & GDP per capita in these 5 countries? Which one could represent the Development Level of a country?

Answer:



Country	GDP per capita(USD)	GDP(USD Million)
Singapore	63,987	362,818
Japan	40,846	5,154,475
Taiwan	24,827	586,104
Sri Lanka	3,946	86,566
Vietnam	2,740	261,637

Finding : GDP per capita could represent the Development Level of a country

Developed Countries: Singapore, Japan, Taiwan

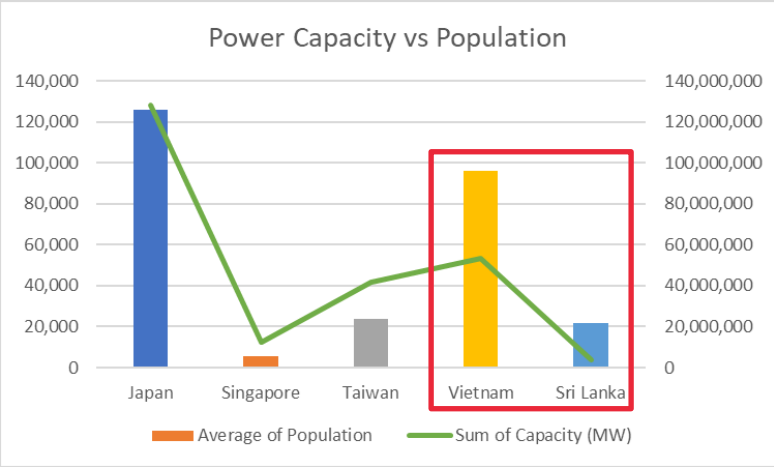
Developing Countries: Sri Lanka, Vietnam

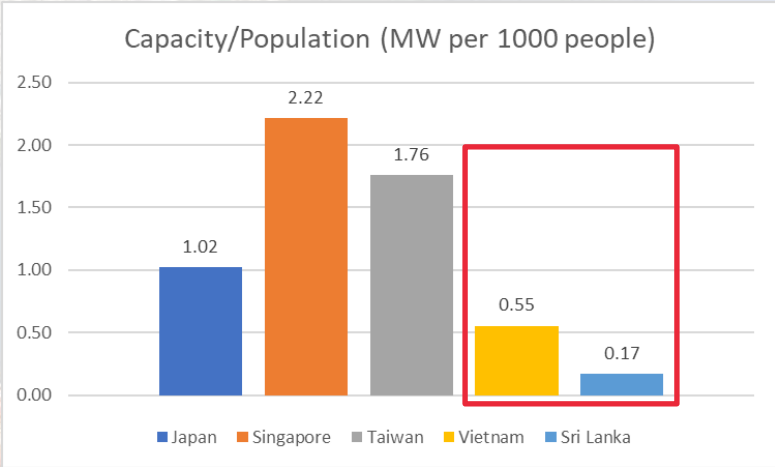
Findings

Which Country facing Shortage of Power Generating Capacity?

Question: 3. Does individual citizen have enough power supply? What is the Occupancy Rate of Power Generating Capacity for individual?

Answer:





Finding :

Developed Country: Capacity covers the demand from individual citizen;

Developing Countries: Capacity is under the demand by each people.

=> In long term, more Power Station are to be constructed to meet the demand from individual citizen. There are long-term market potential in both Vietnam & Sri Lanka.

<=Problem partially solved

Findings

Which Country facing Shortage of Power Generating Capacity?

Finding :

In long term, more Power Station are to be constructed to meet the demand from individual citizen. **There are long-term market potential in both Vietnam & Sri Lanka.**

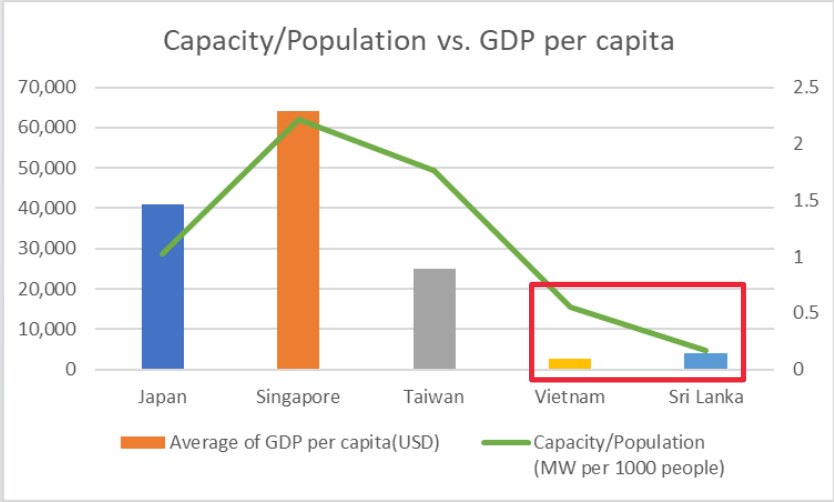
=> **Question**: 4. As Vietnam & Sri Lanka are still developing countries, currently they might not need as much Power Generating Capacity as developed countries with respect to their current Development Level. So, are they really in shortage of Power Generating Capacity in this stage? **Which one has more market potential?**

Findings

Which Country facing Shortage of Power Generating Capacity?

Question: 4. As Vietnam & Sri Lanka are still developing countries, currently they might not need as much Power Generating Rate as developed countries with respect to their Development Level. So, are they really in shortage of Power Generating Capacity in this stage? Which one has more market potential?

Answer:



Finding :

Developed Country: Already developed, Capacity already meet needs. Tend to cut down the Capacity, improve Transfer Rate

Developing Countries: Developing in speed, need more capacity to meet industry developing demand.

=>Compared to Sri Lanka, Vietnam have already built up enough Power Station to meet industry developing demand.

Hypothesis=> Shortage of Power Generating Capacity is restricting industry development in Sri Lanka

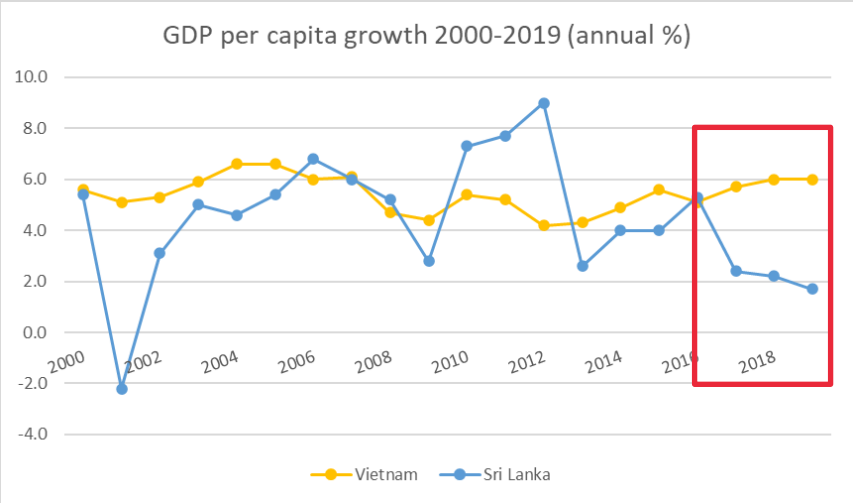
Findings

Which Country facing Shortage of Power Generating Capacity?

Hypothesis=> Shortage of Power Generating Capacity is restricting industry development in Sri Lanka

Question: 5. Is Sri Lanka developing well compared to Vietnam? What are their annual growth rate in GDP per capita?

Answer:



Finding :

Compared to Vietnam, the Developing Speed in Sri Lanka **drops drastically** in recent years.(2017-2019)

=> Shortage of Power Generating Capacity might be one of the reason restricting industry development in Sri Lanka.

=>Sri Lanka is badly in need of new Power Stations.

=>In short term, there will be more market potential in Sri Lanka.

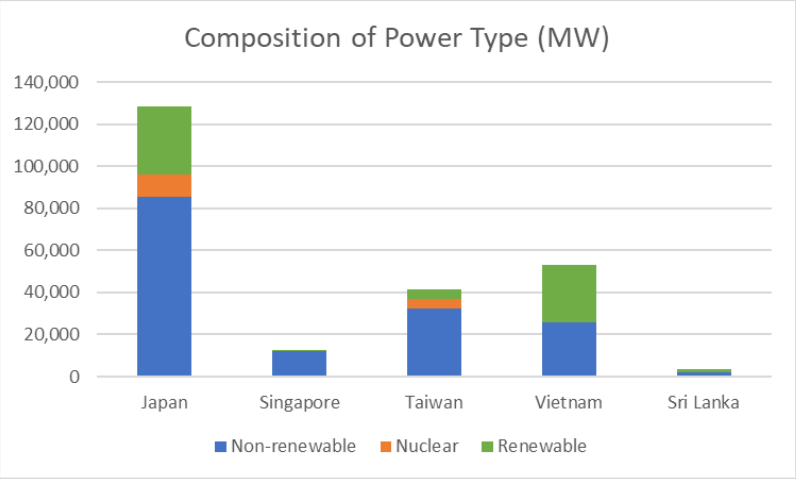
<=Problem solved

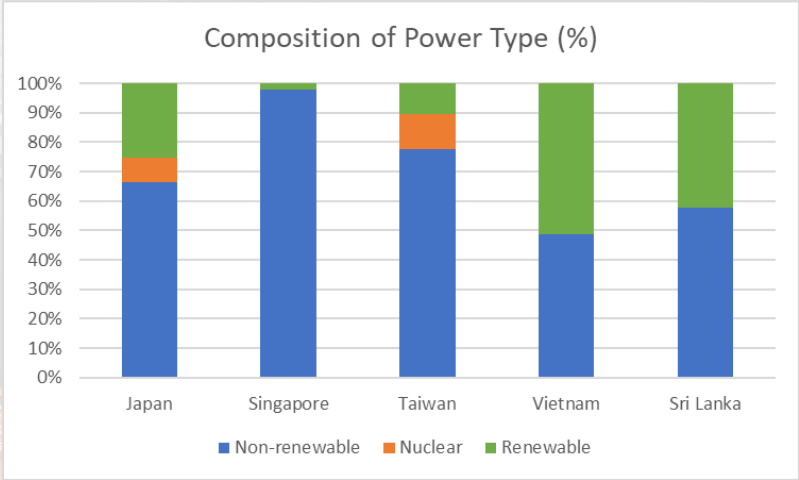
What's more

Which field to step into?

Question: 6. What is the Composition of Power Type in these 5 countries? (i.e. Non-renewable/Nuclear/Renewable)

Answer:





Finding :

Developed Country: high composition in Non-renewable, Developing Countries have relatively high composition in Renewable

Developing Countries: Vietnam and Sri Lanka shares similar composition.(half-half)

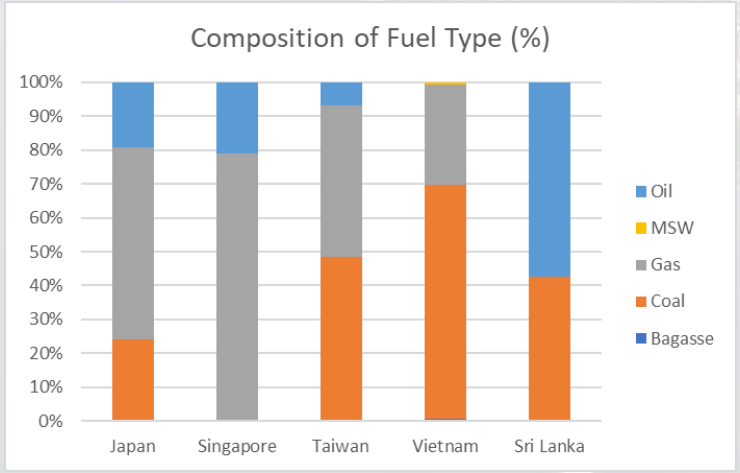
=> Power Stations are built recently when world tends to be Renewable Energy.

What's more

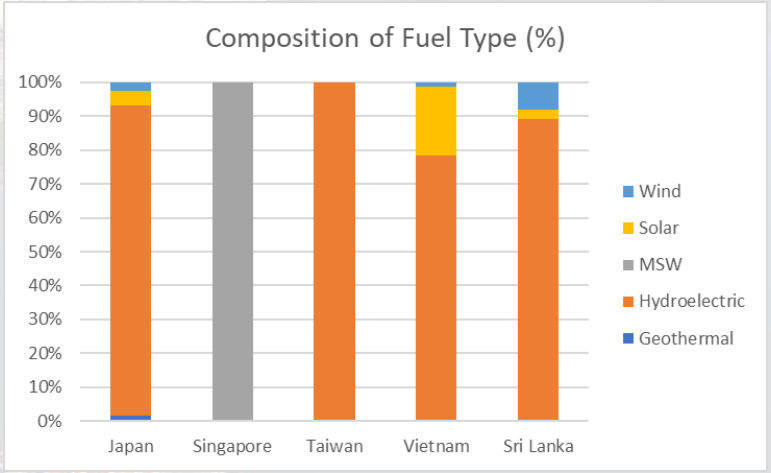
Which field to step into?

Question: 7. What is the Composition of Fuel Type in these 5 countries? (Non-Renewable/Renewable)

Answer:



Non-Renewable



Renewable

Finding :

Vietnam: Non-Renewable: Short of Oil sources.
Renewable: Short of Wind.

Sri Lanka: Non-Renewable: Relies heavily on Oil, short of Gas (maybe due to lack of importing facility)
Renewable: Short of Solar.

Conclusion

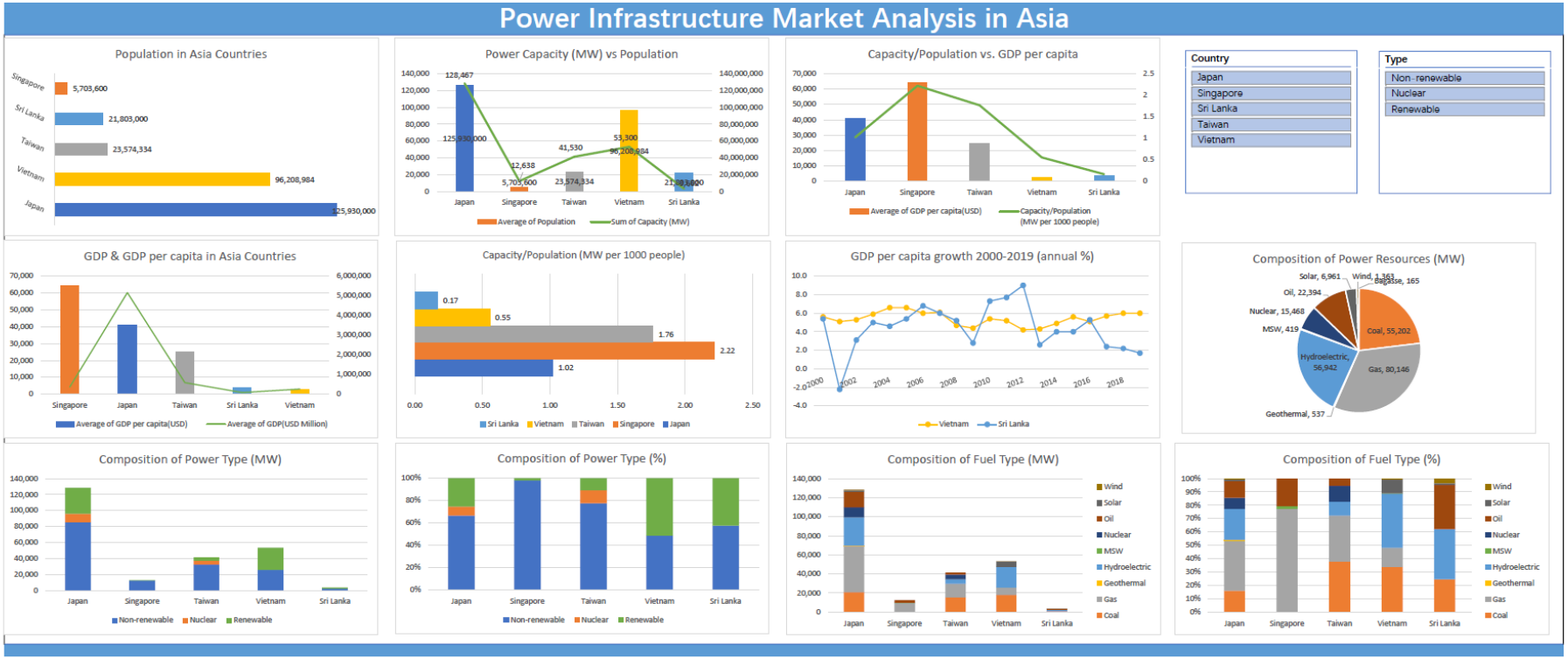
Market Potential:

1. In **short term**, there will be more market potential in **Sri Lanka**.
2. In **long term**, There will be market potential in both **Vietnam** & **Sri Lanka**.

Field to step in:

1. In **Vietnam**, look more into **Oil** in Non-Renewable, **Wind** in Renewable
2. In **Sri Lanka**, look more into **Gas** in Non-Renewable, **Solar** in Renewable

Q & A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Population in Asia Countries
Singapore
Sri Lanka
Taiwan
Vietnam
Japan
5,703,600
21,803,000
23,574,334
96,208,984
125,930,000
Power Capacity (MW) vs Population
Japan
Singapore
Taiwan
Vietnam
Sri Lanka
Average of Population
Sum of Capacity (MW)
Capacity/Population vs. GDP per capita
Average of GDP per capita(USD)
Capacity/Population (MW per 1000 people)
Country
Japan
Singapore
Sri Lanka
Taiwan
Vietnam
Type
Non-renewable
Nuclear
Renewable
GDP & GDP per capita in Asia Countries
Average of GDP per capita(USD)
Average of GDP(USD Million)
Capacity/Population (MW per 1000 people)
GDP per capita growth 2000-2019 (annual %)
Composition of Power Resources (MW)
Solar, 6,961
Wind, 1,383
Biogasse, 165
Oil, 22,394
Nuclear, 15,468
MSW, 419
Coal, 55,202
Hydroelectric, 56,942
Gas, 80,146
Geothermal, 537
Composition of Power Type (MW)
Non-renewable
Nuclear
Renewable
Composition of Power Type (%)
Composition of Fuel Type (MW)
Wind
Solar
Oil
Nuclear
MSW
Hydroelectric
Geothermal
Gas
Coal
Composition of Fuel Type (%)

Thank you!

Li Zheming