

IEEJ: 2008年1月掲載



Asia-Pacific
Economic Cooperation

Asia Pacific Energy
Research Centre



Oil Supply Security Risk and Offset Potential in the APEC Region: An Initial Perspective

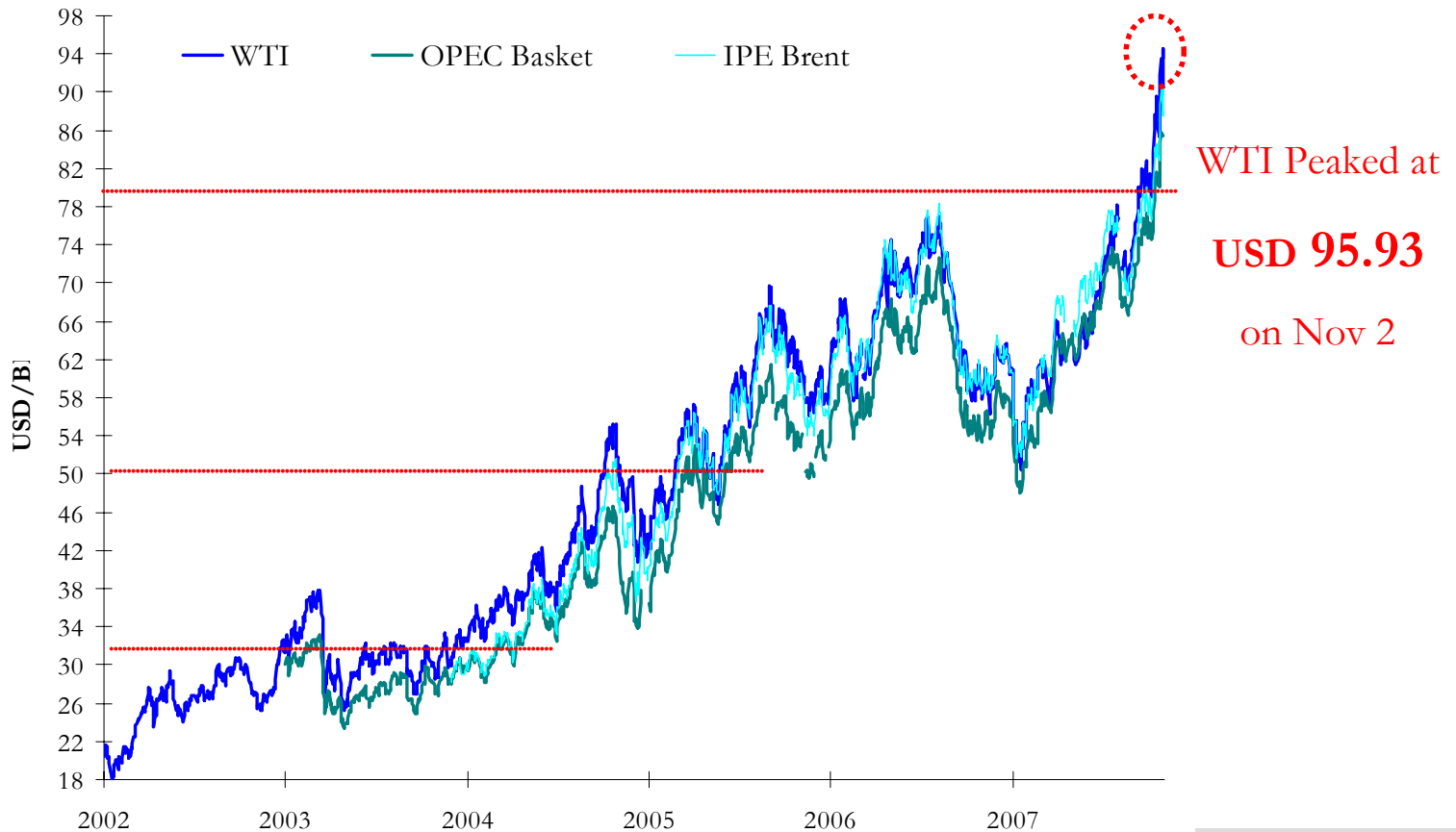
IAEE 2007 Asian Conference
Taipei, Taiwan
5 November 2007

Alicia A. Aponte
Asia Pacific Energy Research Centre



FACT

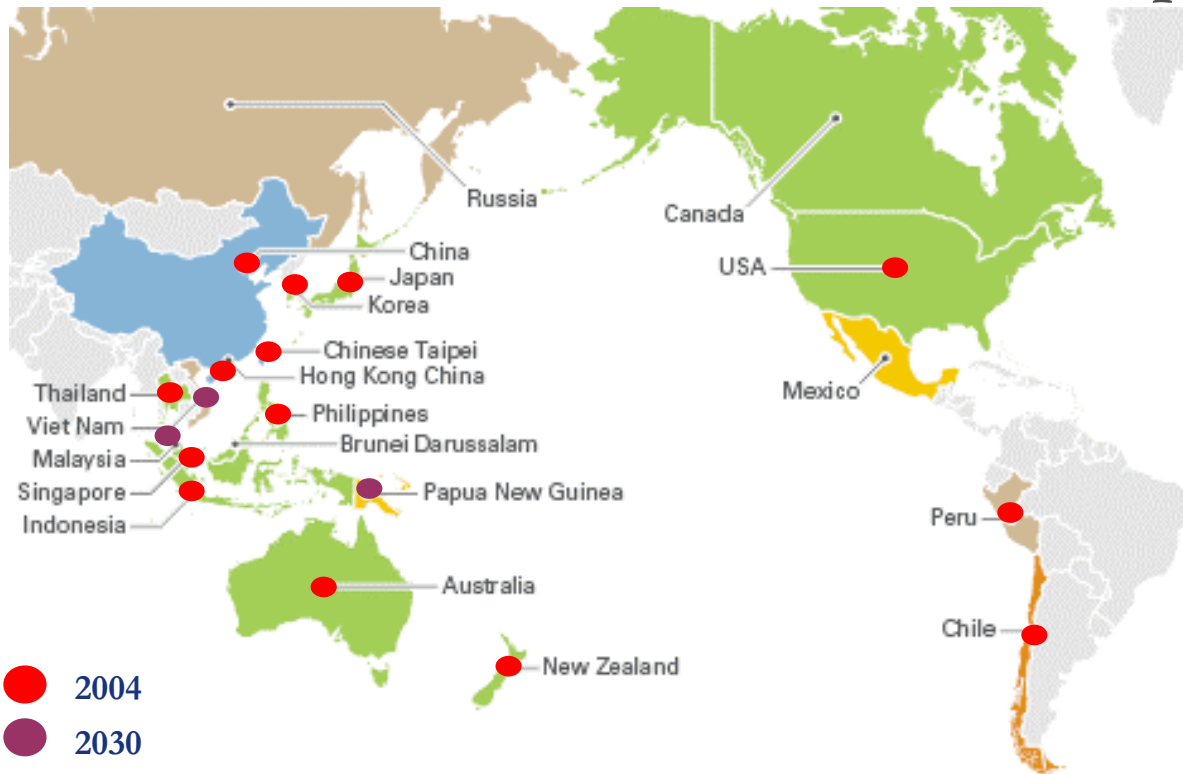
Oil prices have quadrupled since 2002





FACT

14 out of 21 APEC economies are net oil importers *

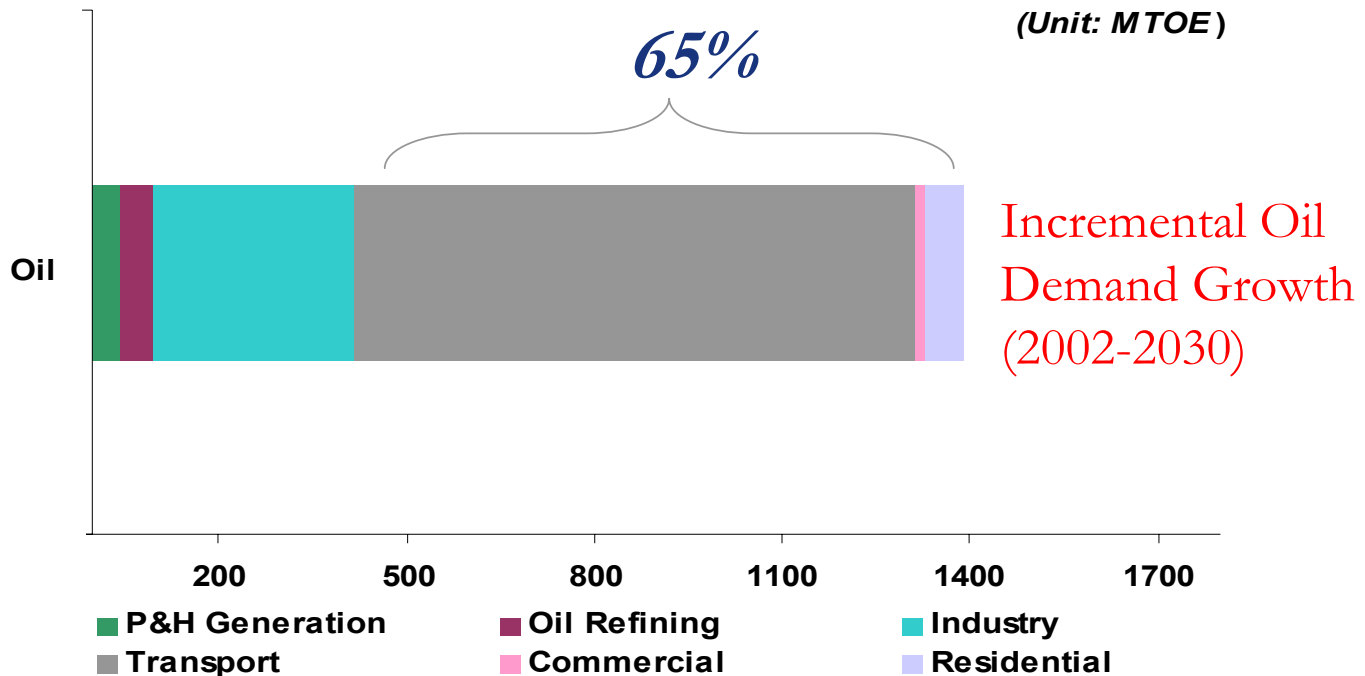


Projected to reach 17 net importers by 2030



FACT

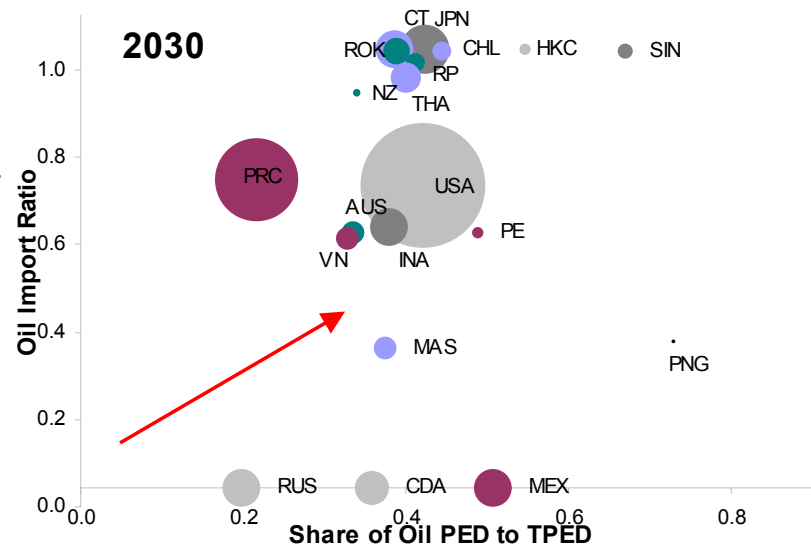
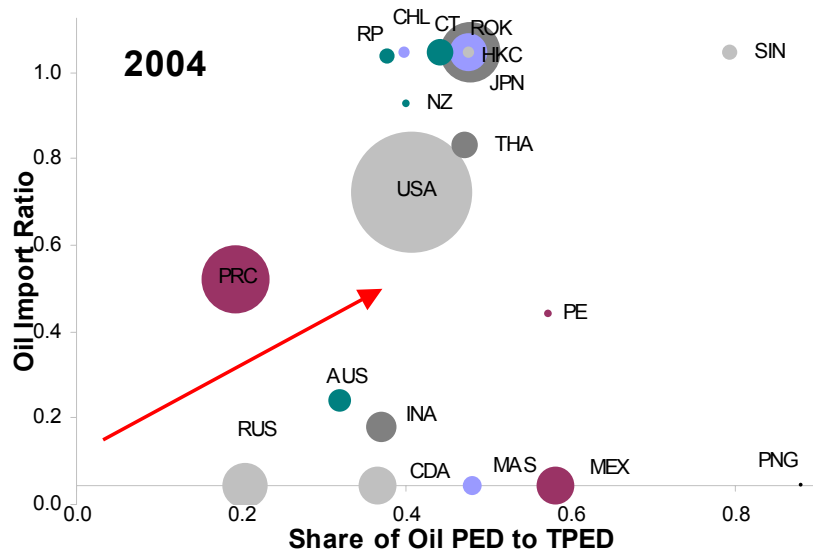
Transport Sector Driving Oil Demand





Potential Future

Oil to grow at 1.7% annually & retain largest share of TPED



Economies move towards higher oil dependence



Contents

- **Oil Supply Security Indexes**
 - What are Oil Supply Risk and Oil Supply Offset Indexes?
 - Which economies were analyzed and why?
 - What influenced an economy's ranking?
 - How have these rankings changed over time?
- **Case example: Index as a comparative tool**
- **Initial Implications**



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Oil Supply Security Indexes

Oil Supply Risk Index

Weighted average of indicators listed below:

- Per Capita Oil Consumption
- Oil Demand Elasticity
 - (GDP/toe)
- Economic Risk of Imports
- Political Stability Risks
 - Related to oil imports
- Refining Infrastructure Capacity
 - Income normalized oil product import dependence

Oil Supply Offset Index

Weighted average of indicators listed below:

- Domestic Resource Capacity
- Non-Energy Intensive Industry Structure
 - Move towards service based economic structure
- Emergency Oil Stocks
 - SPR and Commercial Stocks
- Non-Carbon based Fuel Portfolio

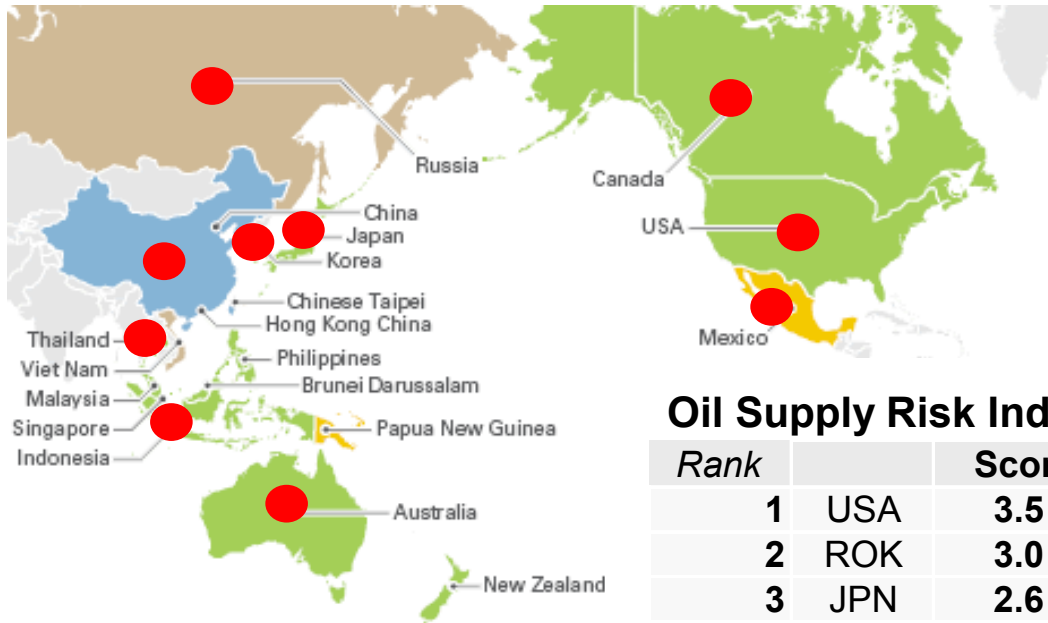


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Oil Supply Security Indexes: 2004



Oil Supply Risk Index

Rank		Score
1	USA	3.5
2	ROK	3.0
3	JPN	2.6
4	PRC	2.5
5	INA	2.5
6	CDA	2.5
7	THA	2.1
8	AUS	1.8
9	MEX	1.4
10	RUS	1.1

Oil Supply Offset Index

Rank		Score
1	RUS	14.5
2	MEX	14.0
3	AUS	13.9
4	USA	13.9
5	CDA	13.2
6	PRC	12.1
7	INA	11.0
8	JPN	8.7
9	THA	8.0
10	ROK	6.0



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Oil Supply Security Indexes: 2004

Rank		Oil Consumption (MEX=10)
1	USA	34.9
2	ROK	22.8
5	INA	3.2
9	MEX	10.0
10	RUS	9.8

Oil Supply Risk Index

Rank		Score
1	USA	3.5
2	ROK	3.0
3	JPN	2.6
4	PRC	2.5
5	INA	2.5
6	CDA	2.5
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Oil Supply Offset Index

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- Top 3 supply risk ranking economies have higher oil consumption rates



Oil Supply Security Indexes: 2004

Oil Supply Risk Index

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Oil Supply Offset Index

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1	RUS	14.5
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7	INA	11.0
8	JPN	8.7
9	THA	8.0
10	ROK	6.0

Rank		Domestic Resource Capacity	Non-Energy Intensive Industry Structure
1	RUS	97.5	60.0
2	MEX	86.2	70.0
5	CDA	68.6	66.2
9	THA	43.0	46.0
10	ROK	2.8	56.0

- Top 3 supply risk ranking economies have higher oil consumption rates
- High domestic resource capacity & greater non-energy intensive industry structure tends to have the highest offset potential.

(Note) Findings are relative to an economy's economic level



Oil Supply Security Indexes: 2004

Oil Supply Risk Index

Rank		Score	
1	USA	3.5	
2	ROK	3.0	
3	JPN	2.6	
4	PRC	2.5	
5	INA	2.5	
6	CDA	2.5	
7	THA	2.1	
8	AUS	1.8	●
9	MEX	1.4	●
10	RUS	1.1	●

Oil Supply Offset Index

Rank		Score
1	RUS	14.5
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3	AUS	13.9
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7	INA	11.0
8	JPN	8.7
9	THA	8.0
10	ROK	6.0

- Top 3 supply risk ranking economies have higher oil consumption rates
- High domestic resource capacity & greater non-energy intensive industry structure tends to have the highest offset potential.
- Economies with the highest oil supply offset tend to have lowest oil supply risk.

(Note) Findings are relative to an economy's economic level



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Oil Supply Security Indexes, 1996 & 2004

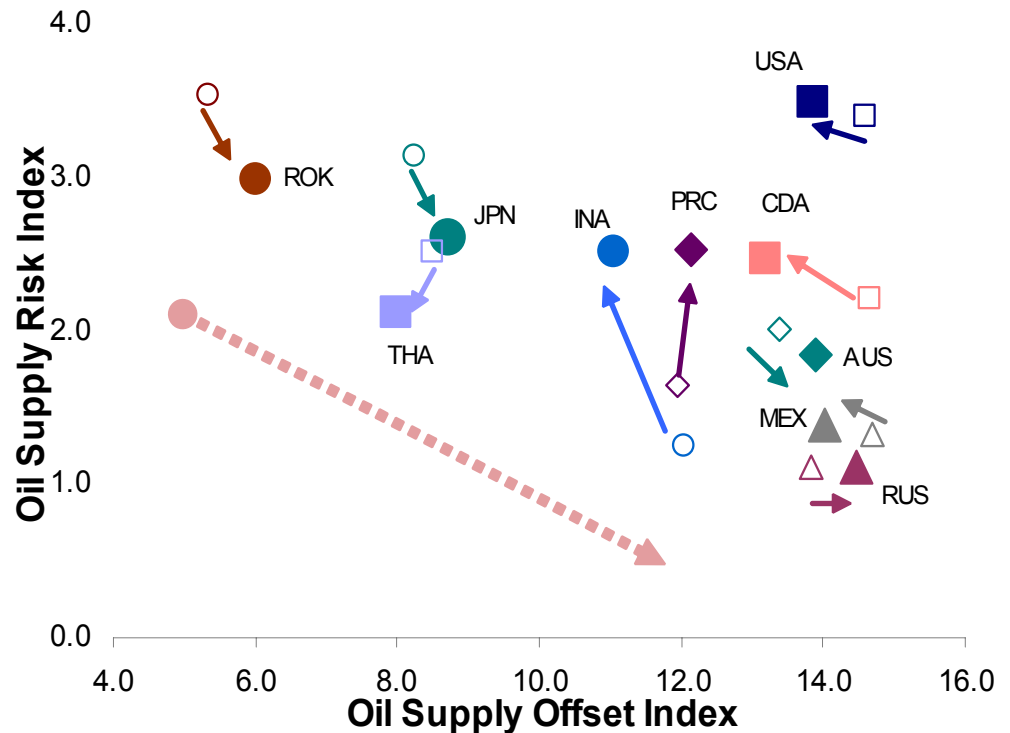
SHIFTS TOWARD LOWER RISK

- Reduced oil consumption
- Fuel Switching/EE improvements
- Industry Structure

SHIFTS TOWARD HIGHER RISK

- Increase in oil consumption
- Domestic resource depletion
- Rapid industrialization / Motorization

Ideal Path is Towards the Lower Right





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Case Example: Index as a Comparative Tool

Example: China

Oil Consumption (toe/capita)	Economic Risk of Imports	Oil Demand Elasticity
2004	2004	
0.2	27.3	0.57

Reference: Oil Supply Risk Index

	Oil Consumption (toe/capita)		Oil Demand Elasticity		Oil Consumption (MEX=10)	Economic Risk of Imports	Oil Demand Elasticity (RUS=10)
	2004			Rank			
USA	3.2	THA	1.15	1	USA	34.9	6.2
CDA	3.1	ROK	1.10	2	ROK	22.8	21.7
ROK	2.1	INA	0.90	3	JPN	21.6	9.1
JPN	2.0	MEX	0.56	5	INA	3.2	17.7
AUS	1.8	RUS	0.51	6	CDA	33.3	5.9
MEX	0.9	JPN	0.46	7	THA	7.8	22.6
RUS	0.9	AUS	0.33	8	AUS	19.8	6.5
THA	0.7	USA	0.32	9	MEX	10.0	10.9
INA	0.3	CDA	0.30	10	RUS	9.8	10.0



Case Example: Index as a Comparative Tool



Example: China

Rough Estimate
41.4



Rank		Rough Estimate
1	USA	58.7
2	ROK	50.1
3	JPN	40.3
5	INA	23.5
6	CDA	39.1
7	THA	35.2
8	AUS	26.6
9	MEX	20.9
10	RUS	19.8

OIL SUPPLY RISK INDEX

Rank		Score
1	USA	3.5
2	ROK	3.0
3	JPN	2.6
4	PRC	2.5
5	INA	2.5
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Initial Implications

Oil Supply Security is Often Dependent on an Economy's Stage of Development

- **General strategies to help reduce oil supply risk:**
 - Diversify energy sources
 - Diversify energy import supply
 - Improve energy efficiency

**** Flexible Pro-Active Policy Approach**

- **Short /Medium term:**
 - Refining capacity (specifically upgrading capacity)
- **Medium/Long term:**
 - Improvements in transport efficiency
 - Development of alternative transport fuels

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Thank You for your Attention

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