表紙未完成・・・

New energy group

- Syo-gun
- Nara-ken
- Eritin
- Sino-ra
- Akio

What we are going to say・・・

CO_2 reduction target by new energy

34million t-CO_2

For this target・・・

new energy introduction target

19.1billion l (crude oil equivalent)

Is this introduction target appropriate ?

No!!

What we are going to say･･･

New energy implementation target is not appropriate because･･･

- Regardless of cost
- Reduce CO2 more than target

- For appropriate target･･･

  ⇒our proposal

Structure

- What is New Energy?
- The necessities of New Energy
- The target of implementation
- Current situation in Japan

- The trial calculation
  - About CO2 reduction
  - About cost
- Consideration

What is new energy ?

definition

1. technically available
2. not marketable
3. the alternative energy resource to oil

What is new energy ?

~Kinds of new energy~

new energy

the patterns of energy use

renewable energy

recycled energy

natural energy

・clean energy automobile

・LNG co-generation

・fuel cell

・water power

・geo-thermal energy

・solar energy

・wind power

・solar thermal

・cryogenic power by snow ice

biomass energy

such as・・・

・generation

・thermal utilization

・fuel fabrication

・ocean energy

waste combustion

such as・・・

・generation

・thermal utilization

・fuel fabrication

・temperature difference

Classification of new energy

Power generation field

- solar energy
- wind-power
- waste combustion energy
- biomass energy

Thermal utilization field

- solar thermal
- unutilized energy
- waste combustion utilization
- biomass thermal utilization

Merits and Demerits

Merits

domestically produced

no exhaustible resource

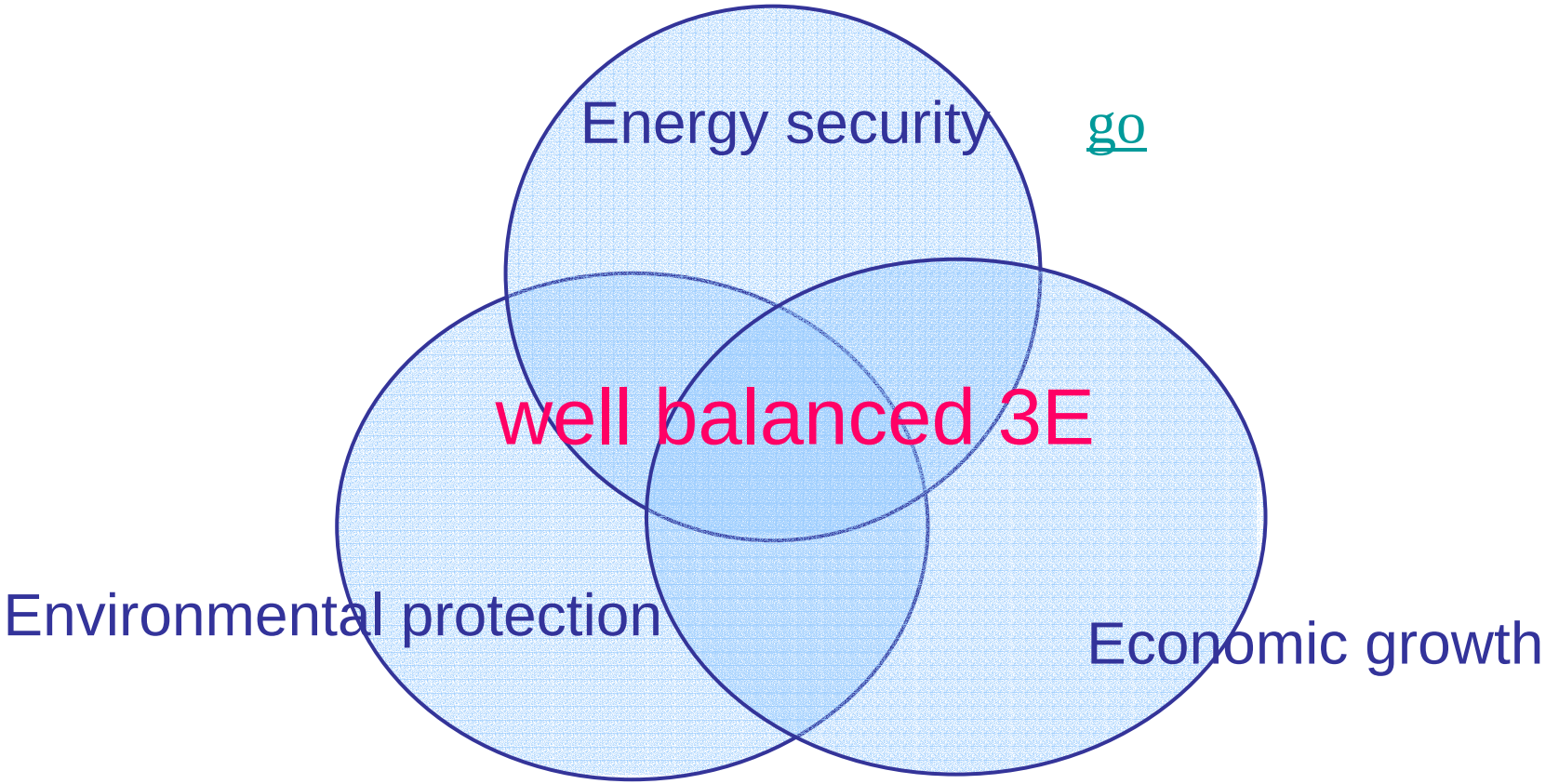
less CO_2 emissions ★

Demerits

- Unstable electrical output
- energy conversion efficiency is low
- cost is high ★

The necessities of new energy

the image to accomplish 3 targets of energy policy



New energy & 3E

New energy matches 3E !!

Structure

- What is New Energy?
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Actual result and Target (new energy of supply side)

	Actual result of **1999**		Prospect /target of **2010**			
			Case of keeping the current measure		**Target case**	
	Convert into oil	Capacity of plant	Convert into oil	Capacity of plant	Convert into oil	Capacity of plant
	10000kl	10000kW	10000kl	10000kW	10000kl	10000kW
Power generation field						
Solar energy	**5.3**		**About 23 times**		**118**	482
Wind power	**3.5**		**About 38 times**		**134**	300
Waste combustion energy	**115**		**About 5 times**		**552**	417
Biomass energy	**5.4**		**About 6 times**		**34**	33

Actual result and Target (new energy of supply side)

	Actual result of **1999**		Prospect /target of **2010**			
			Case of keeping the current measure		**Target case**	
	Convert into oil	Capacity of plant	Convert into oil	Capacity of plant	Convert into oil	Capacity of plant
	10000kl	10000kW	10000kl	10000kW	10000kl	10000kW
Thermal utilization field						
Solar thermal	**98**		**About 4 times**		**439**	**–**
Unutilized energy	**4.1**		**About 14 times**		**58**	**–**
Waste combustion utilization	**4.4**		**About 3 times**		**14**	**–**
Biomass thermal utilization	**–**	**–**	**–**	**–**	**67**	**–**
Black liquor/scrap wood etc.	**457**		**About 1.1 times**		**494**	**–**

RPS (Renewables Portfolio Standard) in Japan

What is RPS system ?

The system to introduce new energy certainly and cost-effectively

Issued in June 2002
Put into force in April 2003

RPS coverage

- RPS
  - ○ Power generation field
  - × Thermal utilization field

Eligible energy sources of RPS

- Wind-power generation
- Solar energy generation
- Geo-thermal generation
- hydraulic power generation (small and medium)

  (✕hydroelectric dam)

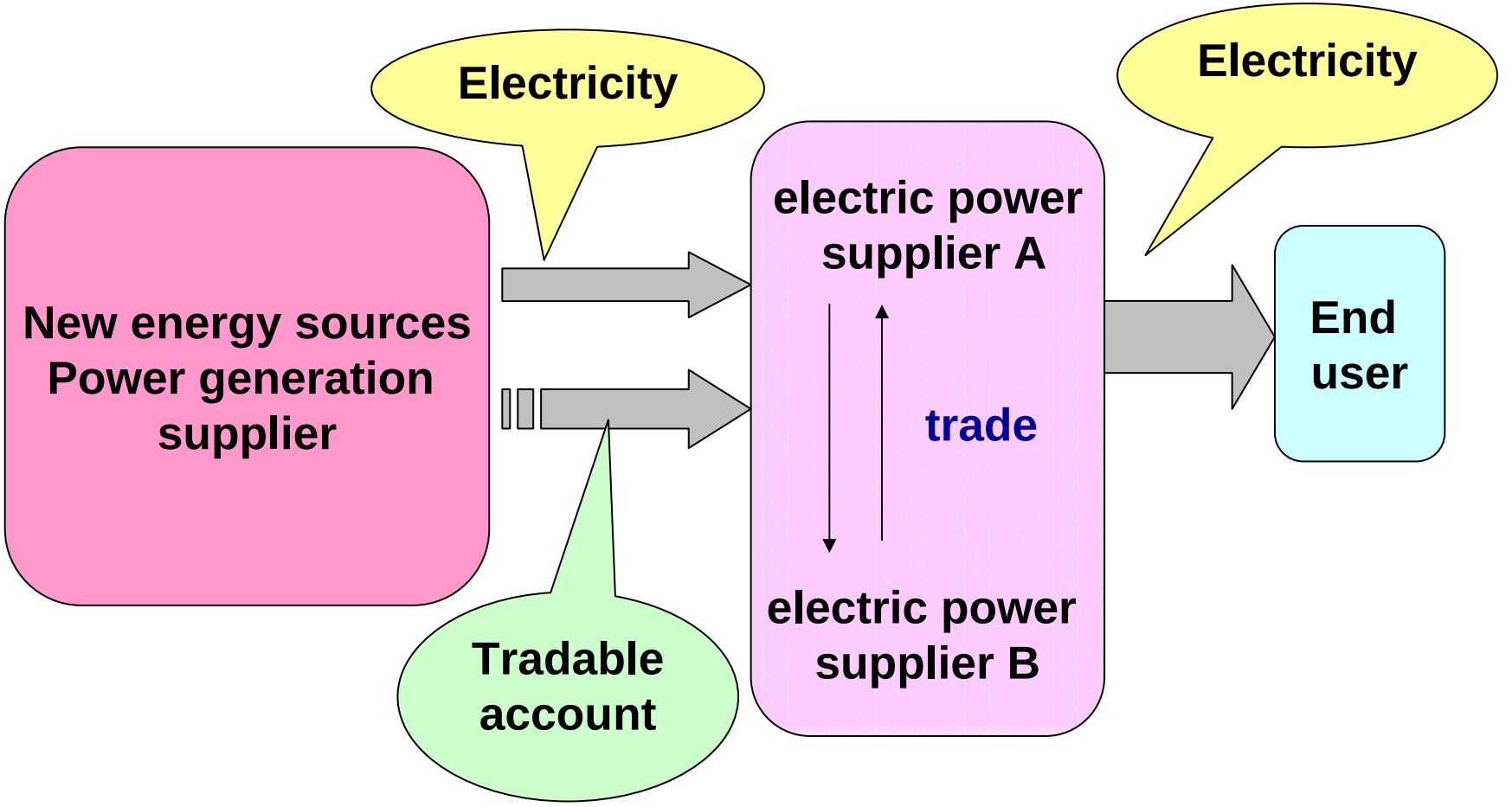
  (○hydraulic turbine)
- Biomass
- waste combustion energy generation

  (only the biomass incineration)

The image of RPS system

RPS is the way to
attain the obligation cost-effectively

The image of Japanese RPS system (1)



The image of Japanese RPS system (2)

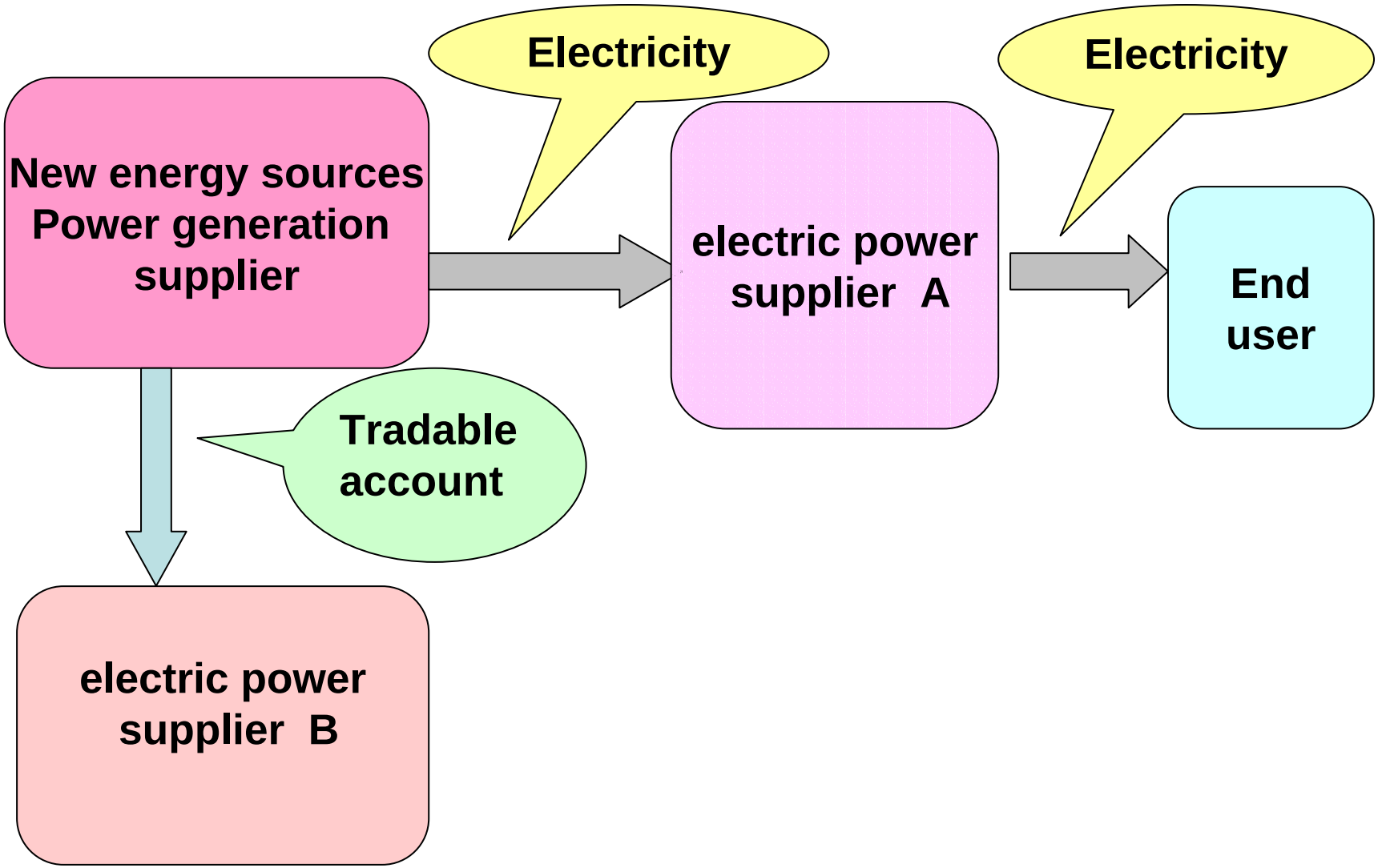
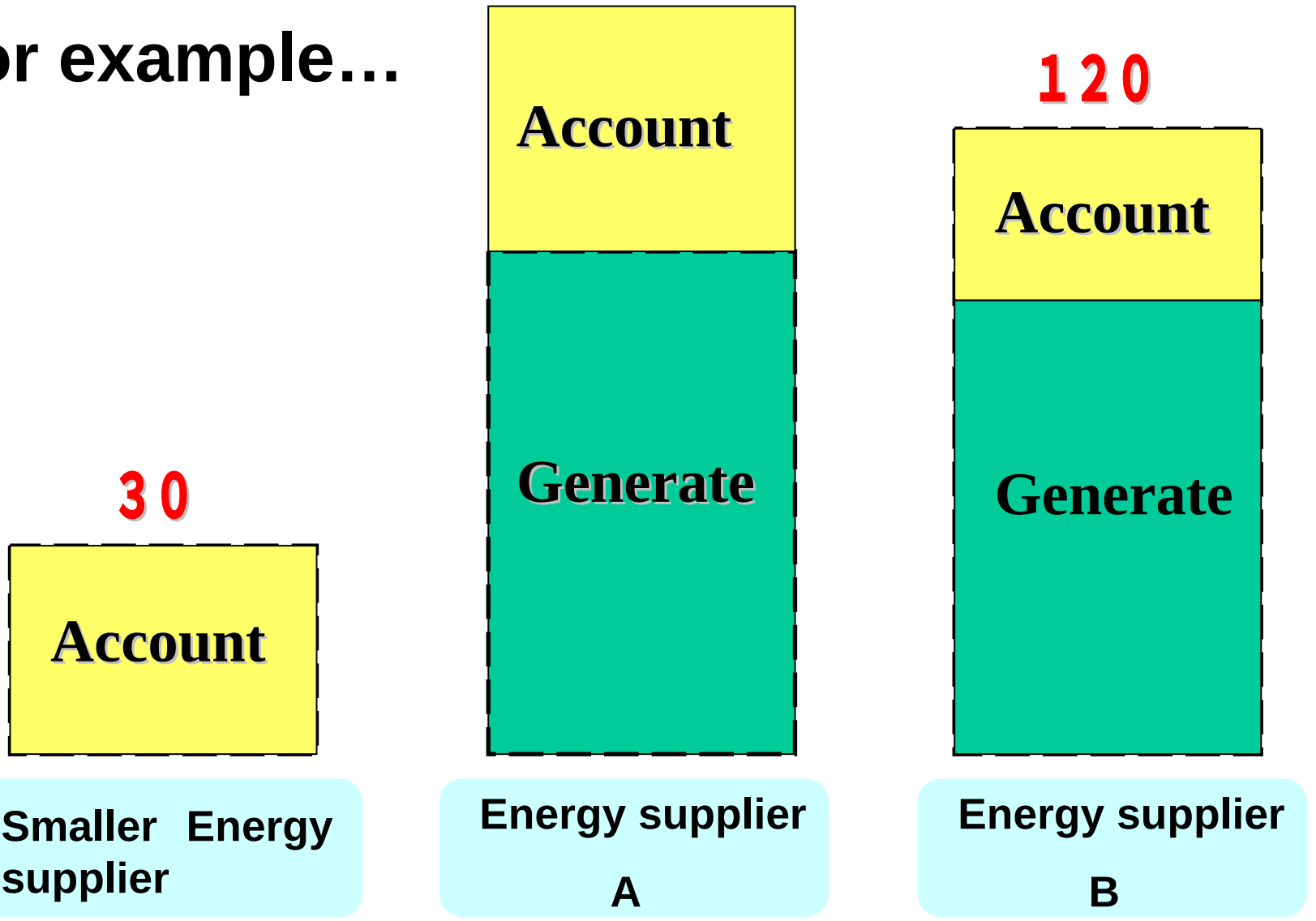
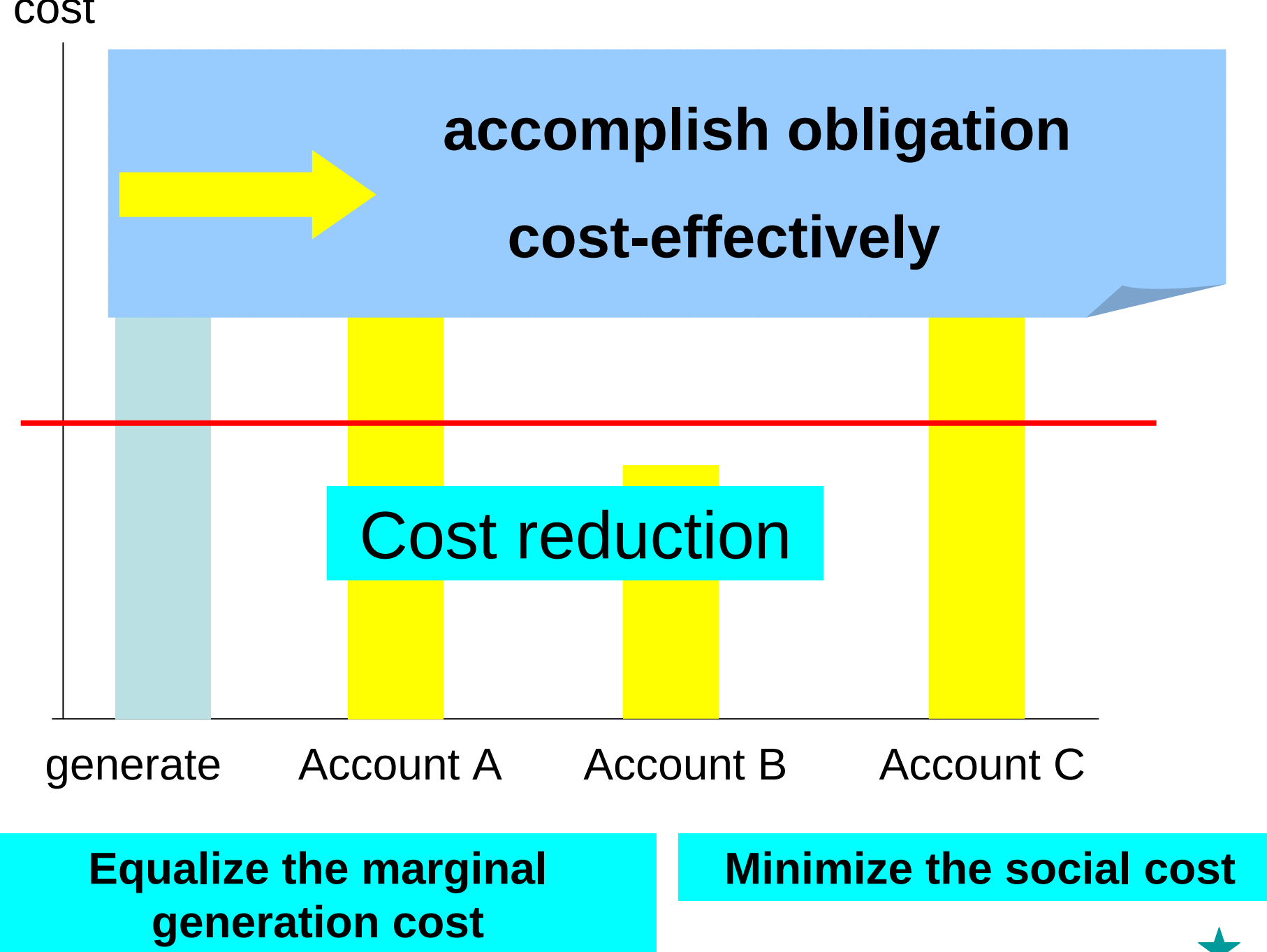


Image breakdown of the account

For example…





Equalize the marginal generation cost

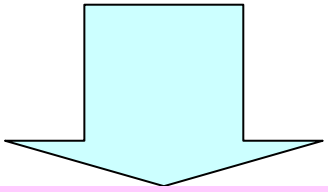
Minimize the social cost

Actual result and Target
(new energy of supply side)

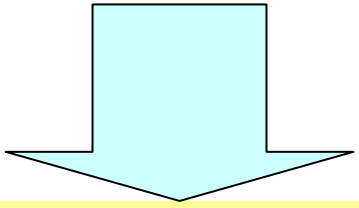
	Actual result of 1999		Actual result of 2001		2010 target case	
	Convert into oil	Capacity of plant	Convert into oil	Capacity of plant	Convert into oil	Capacity of plant
	10000kl	10000kW	10000kl	10000kW	10000kl	10000kW
Thermal utilization field						
Solar thermal	**98**	**–**	**82**	**–**	**439**	**–**
Unutilized energy	**4.1**	**–**	**4.4**	**–**	**58**	**–**
Waste combustion utilization	**4.4**	**–**	**4.5**	**–**	**14**	**–**
Biomass thermal utilization	**–**	**–**	**–**	**–**	**67**	**–**
Black liquor/scrap wood etc.	**457**	**–**	**446**	**–**	**494**	**–**

Thermal utilization field

decreasing demand



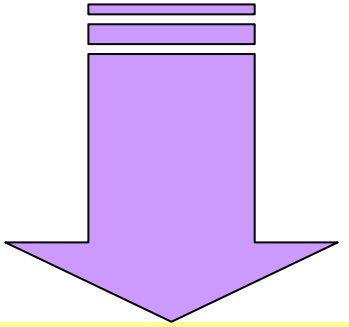
No particular policy



difficult to attain target amount in 2010

summary

To attain introduction target of new energy



In power generation, can attain by RPS

In thermal utilization, difficult !!

Structure

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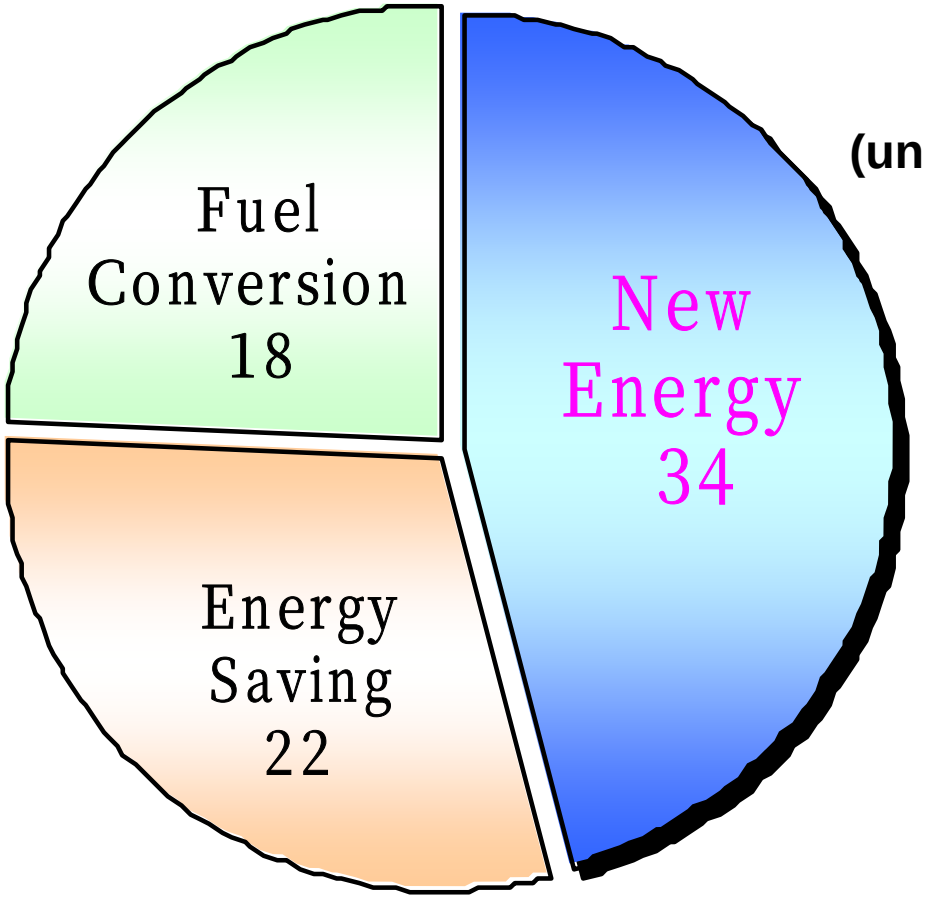
The CO2 reduction target of each Energy sector



(unit: million t-CO2)

Made by presenter,

based on the data by Ministry of the Environment (2002

Amount of CO_2 reduction
power generation field

(unit: million t-CO2)	Alternative for oil (0.742kg-CO2/kwh)	Alternative for Average of all power sources (0.419kg-CO2/kwh)
Solar energy	3.52	1.87
Wind power	4.11	2.27
Waste combustion energy	15.40	7.74
Biomass energy	0.92	0.48
total	***23.95***	***12.36***

Amount of CO_2 reduction
thermal utilization field

(unit: million t-CO2)	Alternative for kerosene (68.5g-CO2/MJ)	Alternative for city gas (58.6g-CO2/MJ)
Solar thermal	11.49	8.60
Unutilized energy	1.52	1.14
Waste combustion utilization	3.72	0.74
Biomass thermal utilization	1.76	1.31
Black liquor/scrap wood, etc	12.93	9.68
total	**28.07**	**23.47**

Amount of CO_2 reduction by new energy

(power generation and thermal utilization field)

- **It c… Achiev… the …get!!**
  (re… …llion t-CO2)
- **Big p… …uction!**

How much is this reduction!?

Structure

- What is New Energy?
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- Current situation in Japan

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Each cost of new energy

Solar energy generation	Residential	average：66 yen/kWh
	Non-residential	average：73 yen/kWh
Wind power generation	Large scale	10～14 yen/kWh
	Smaller scale	18～24 yen/kWh
Waste combustion energy generation*	Industry	9～11 yen/kWh
	General	11～12 yen/kWh
Solar thermal utilization		28 yen/Mcal
Unutilized energy		10 yen/MJ

*including biomass energy generation

(source: report of new energy subcommittee

Cost of power generation

Solar energy generation	Residential	270.6
	Non-residential	73
Wind power generation	Large scale	51～71.4
	Smaller scale	12.6～16.8
Waste combustion energy generation	Industry	108～132
	General	129.8～141.6
Biomass energy generation		12.6~16.8

unit: billion yen　1元＝about 15 yen

Cost of CO2 reduction per t-CO2 (power generation field)

	alternative for oil	alternative for average of all power sources
Solar energy generation	97,614	183,743
Wind-power generation	15,474~21,460	28,018~38,855
Waste combustion energy generation	15,442~17,766	30,724~35,349
Biomass energy generation	13,696~18,261	26,250~35,000

Expensive!

Expensive!

Cheap!

Cheap!

Cheap!

Cheap!

Cheap!

Cheap!

Unit: ※ =about 15 yen

Cost of thermal utilization

Solar thermal utilization	1,122.2
Unutilized energy	221.6
Waste combustion utilization	53.5
Biomass thermal utilization	255.9
Black liquor/scrap wood etc.	1,887.1

unit: billion yen　1元＝about 15 yen

Cost of CO2 reduction per t-CO2 (thermal utilization field)

	alternative for kerosene	alternative for city gas
Solar thermal utilization	93	130,448
[illegible]	[illegible]	,932
Waste	[illegible]	932
Biomass thermal	985	194,932
Black liquor/scrap wood etc.	145,985	194,932

Unit: yen　1元=about 15 yen

Expensive!


Actual result of
case
city
nt
kW
482
–
Solar thermal
98
43
Is this considered about cost?

No considering!?

"Target of implementation is based on the possible maximum volume of implementation."

source: report of new energy subcommittee

They don't consider the COST!?

Considerations

Not appropriate!

Set lower implementation target with consideration about cost !!

If consider only about cost

Reduce about

356.7billion yen

～2,560billion yen !!

Cost factor is very important !

***1元＝about15yen**

Our proposal

Set appropriate target

with consideration about cost !!

Special Thanks

- The Institute of Energy Economics, Japan Mr. Tsutomu Toichi
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- Agency for Natural Resources and Energy, Energy Conservation and Renewable Energy Department Mr. Yasuhiro Nagami
- Agency for Natural Resources and Energy,Energy Conservation and Renewable Energy Department Ms. Eri Nakajima

Internet Resources

- Ministry of Environment http://www.env.go.jp/index.html
- Ministry of economy, trade and industry http://www.meti.go.jp/
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- Central Research Institute of Electric Power Industry http://criepi.denken.or.jp/jpn/
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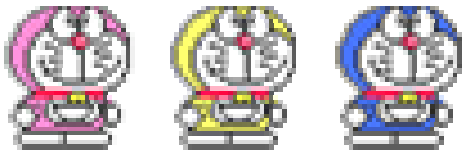
謝謝！



new energy ≠ renewable energy

- hydraulic power generation
- geo-thermal generation

are renewable energy, but are not new energy.
because they are not economically inefficient.

renewable energy
= natural energy + recycled energy
new energy
= renewable energy − hydraulic power generation −geo-thermal generation

- トップランナーは、北のほうで風が吹くところ。を説明する。

preventing CO2 emission

Unless additional measures are taken・・・

exceeds about

74 million t－CO2

additional measures

conserve energy

▲**22** million t－CO2

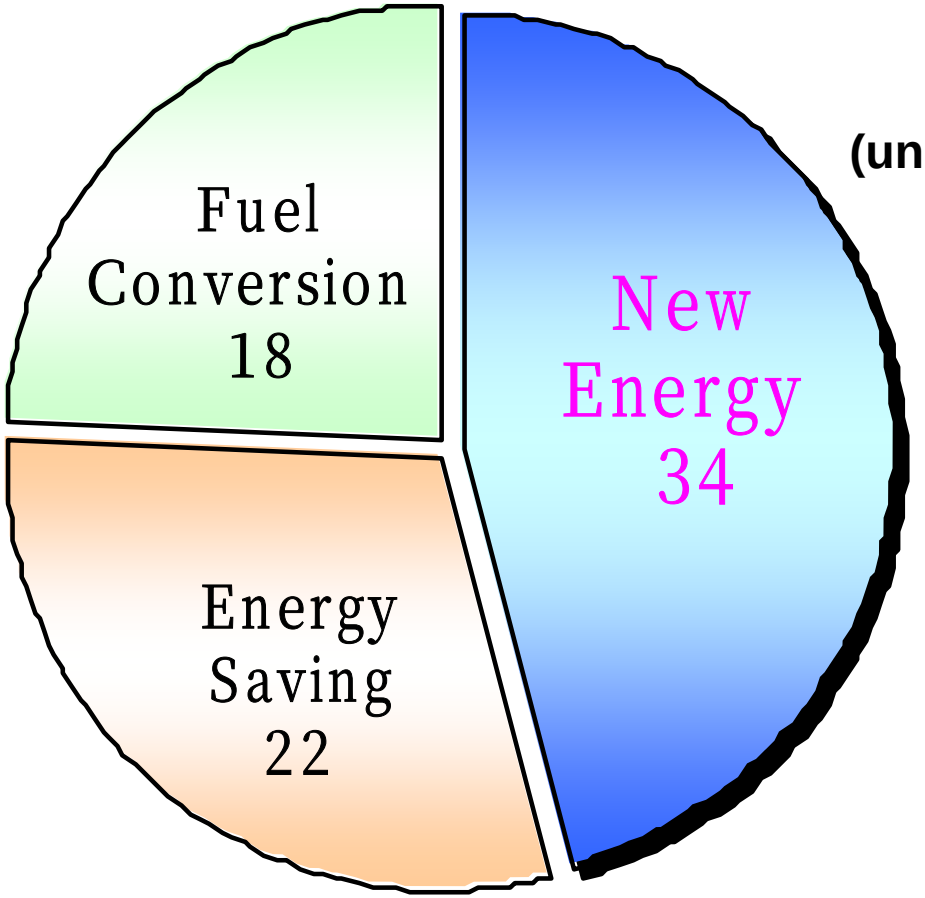
New energy

▲**34** million t－CO2

fuel conversion

▲**18** million t－CO2

The CO2 reduction target of each Energy sector



(unit: million t-CO2)

Made by presenter,

based on the data by Ministry of the Environment (2002

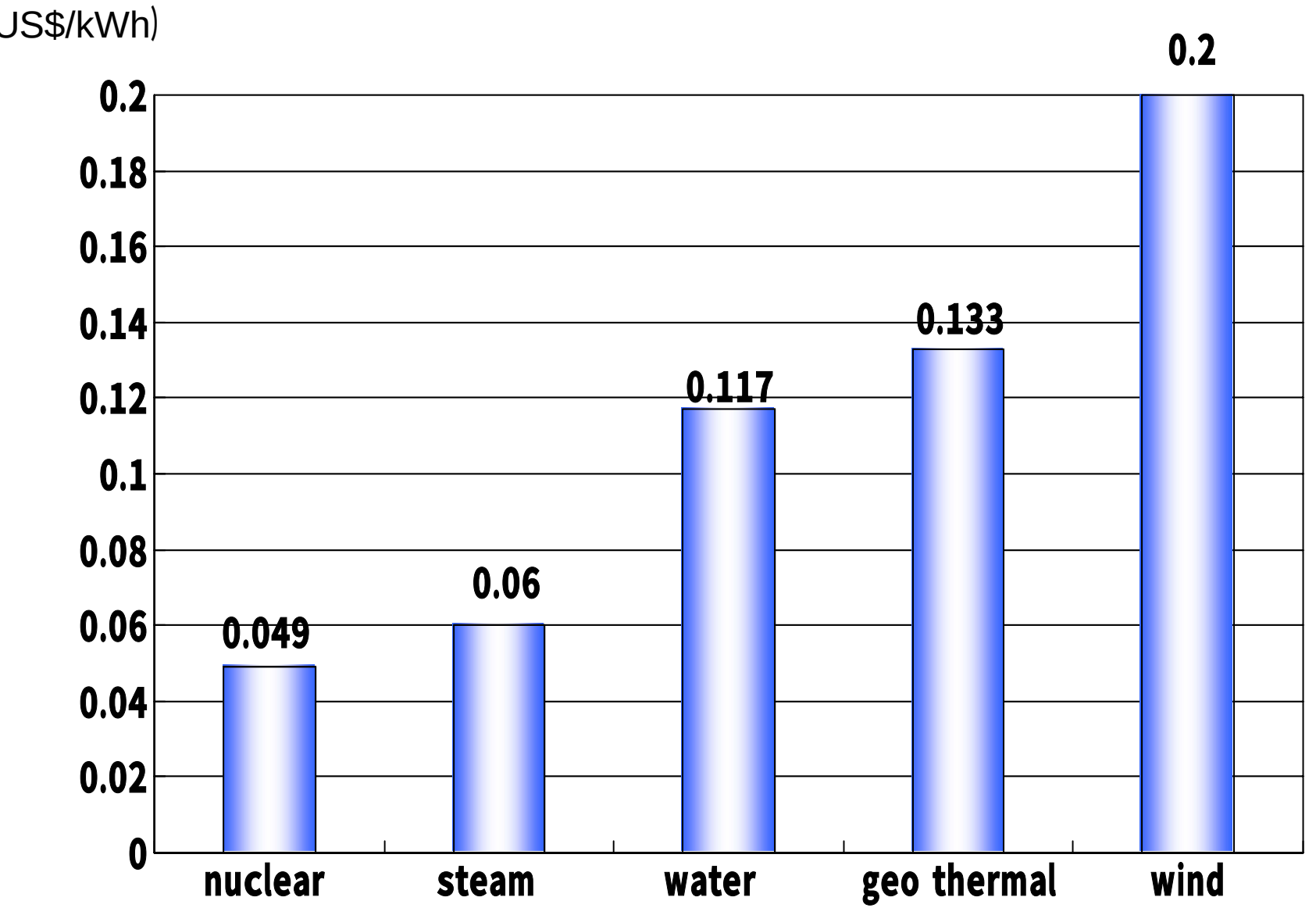
return

Current situation of primary energy in Japan

energy security problem!

return

cost comparison



return

The amount of CO_2 emissions of every resource