



New and Renewable Energy in Korea

- Biodiesel & RFS -

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****NRE: New and Renewable Energy***



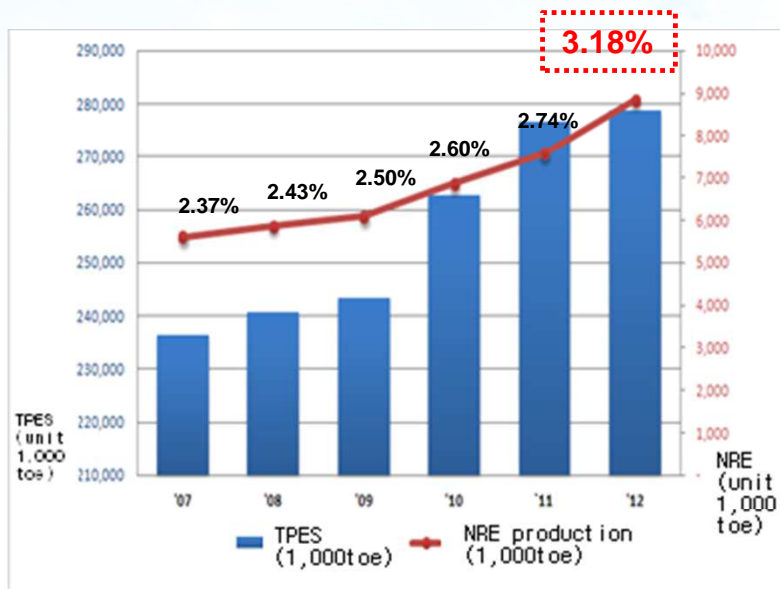
I

The Status of New and Renewable Energy in Korea

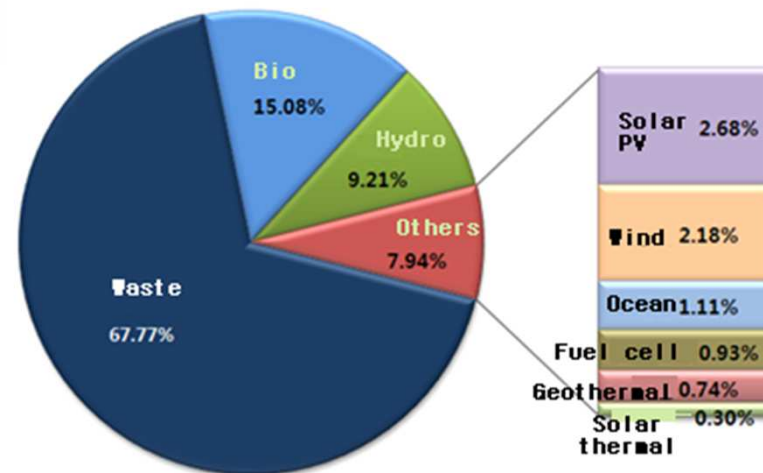
1. The Status of New and Renewable Energy

- ▶ NRE Share in TPES: 3.18% (2012)
- TPES(278,698,000TOE) vs. NRE Supply(8,851,000 TOE)
- ▶ NRE supply has been increased by **annual average of 9.6%** (2007-2012)
(while annual average of TPES growth is 3.3%)

NRE Share in TPES



NRE Supply by Sources



RE : 8 Sources

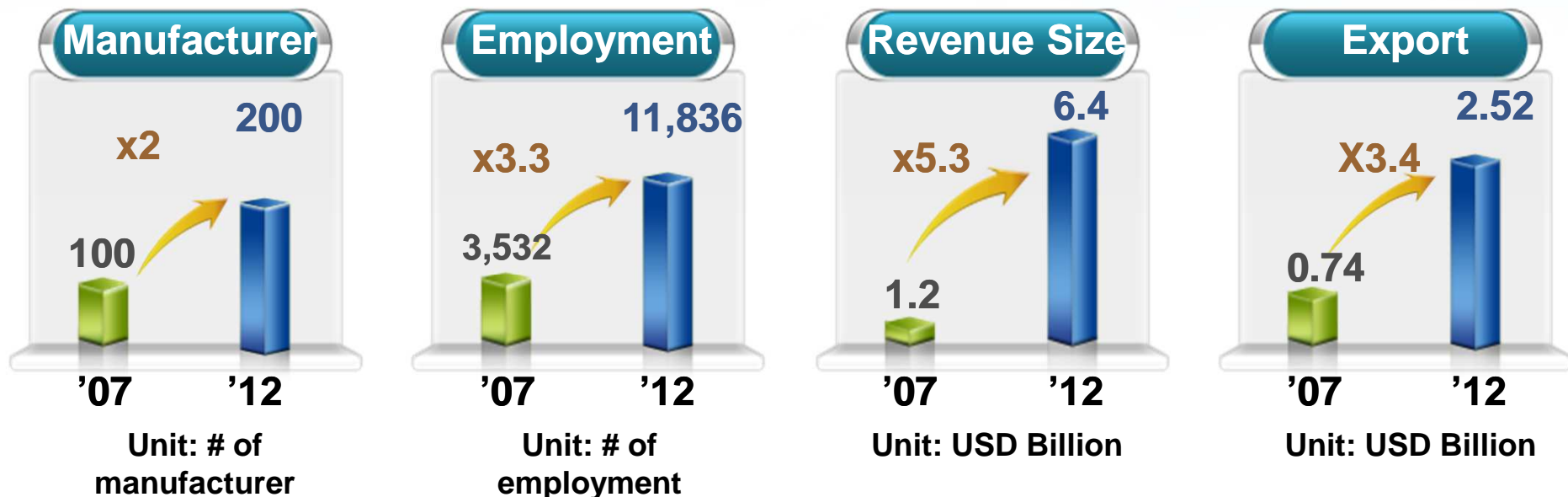
- PV, Solar Thermal, Wind, Waste, Bio(LFG, Bio-Fuels), Hydro, Geothermal, Marine

New Energy : 3 Sources

- Fuel-cell, Hydrogen, Coal Liquefaction or Gasification

2. The Status of NRE Industry

- ▶ Rapid growth of NRE Industry
 - Compared to 2007, the number of manufacturers was **doubled** in 2012
 ☞ 100('07) → 200('12) *Unit: # of manufacturer
 - The revenue size was **increased by 5.3 times** (2007→2012)
 ☞ Despite of the global economic crisis, steady growth of the industry achieved **6.4 billion dollars of revenue** in 2012



* Manufacturers based on 6 Sources(PV, Wind, Bio, Fuel Cell, Solar Thermal, Geothermal)

II

Main Policies and Strategies in New and Renewable Energy

3. Main Policies and Strategies in NRE

- ▶ Budget for 2014 NRE Deployment and Infrastructure: 562.2 million USD
- (Deployment: 553.5 million USD ; Infrastructure : 8.7 million USD)

Function	Object	Method	Program	2014 Budget (Unit: 1 million USD)
NRE Deployment Program	Private Sector	Subsidy	Home Subsidy Program (1 Mil. Homes)	54.9
			Building Subsidy Program	22.5
			Feed-in-Tariffs (FIT)	336
			Overseas Business Support	4.5
		Loan	Financial Support Program	103.4
		Mandatory	Renewable Portfolio Standard (RPS)	0.2
	Public Sector	Subsidy	Regional Deployment Program	21
			Combined Support Program	10
Establishment of NRE Test-bed			1	
	Mandatory	NRE Mandatory Use for Public Buildings	-	
Infrastructure- building Program	Private & Public Sector	-	Certification, Standardization, and International Cooperation	3.3
			R&D(Policy and Regulation)	5.4
Total				562.2

4. 2nd Energy Basic Plan

2nd Energy Basic Plan (2014)

- Goal of Supply 11% from New & Renewable Energy Sources by 2035
- 4th New & Renewable Energy Basic Plan will be announced in 2014

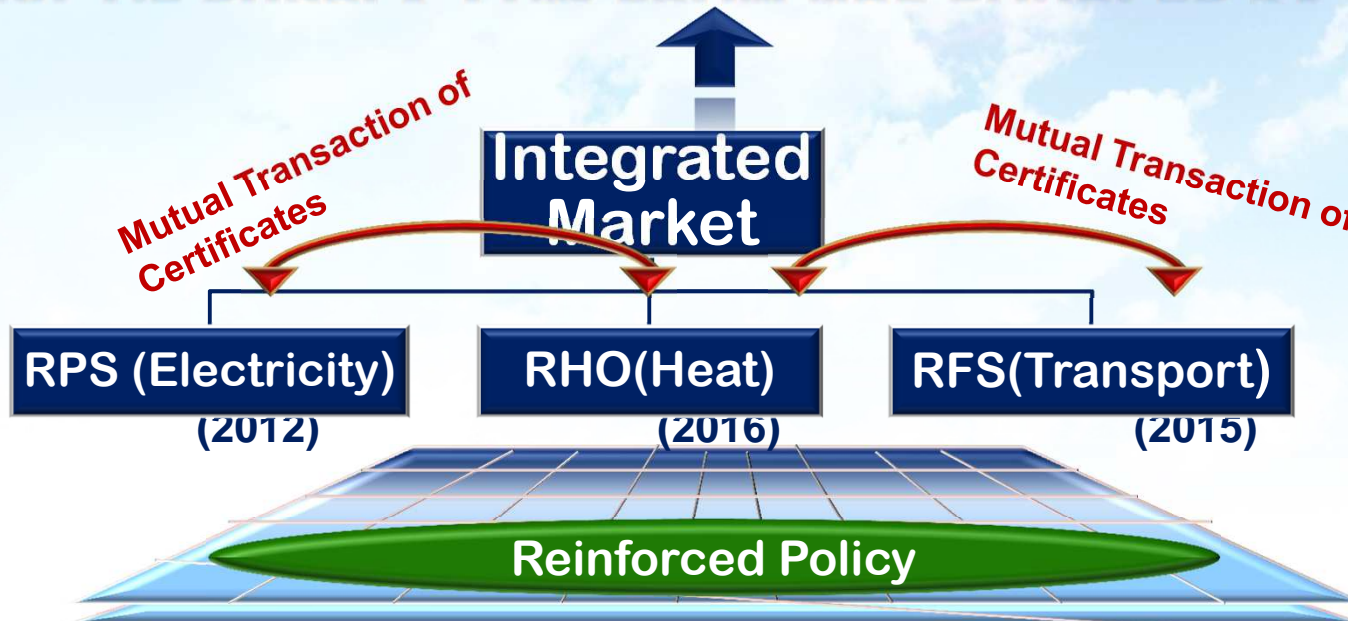
Target for NRE Production Share(%)

- Waste and Hydro will be decreased / PV, Wind, Geothermal, Solar thermal will be increased

NRE Sources	Waste	Hydro	Bio	PV	Wind	Geo-thermal	Solar-thermal	Marine	Total(%)
2020	47.3	6.3	17.6	11.1	11.3	2.5	1.4	2.4	100
2025	40.2	4.3	19.6	13.3	12.5	4.6	3.9	1.6	100
2035	29.2	2.9	17.9	14.1	18.2	8.5	7.9	1.3	100

5. Future Policy Plan

GOAL OF SUPPLY 11% FROM NRE SOURCES BY 2035



RPS (Renewable Portfolio Standard)

- ▶ Enforces 14 power producers to supply certain amount of the total Power generation by NRE

RHO(Renewable Heat Obligation)

- ▶ Obligate new buildings to provide fixed ratio of the heat energy from NRE (will be implemented in 2016)

RFS(Renewable Fuel Standard)

- ▶ Obligate fuel providers to apply certain rate of renewable energy in fuel (will be implemented in 2015)


III

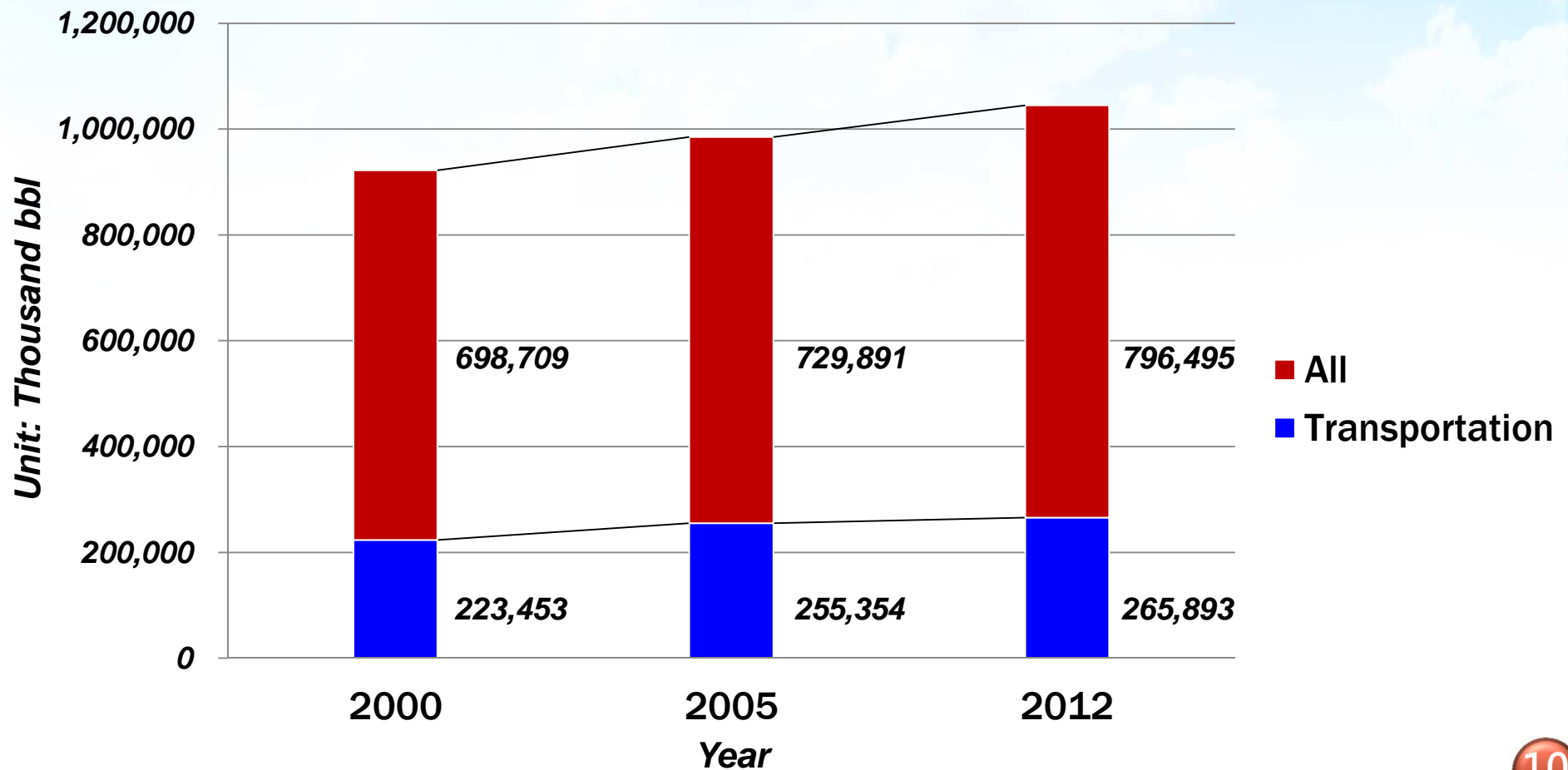
Biodiesel in Korea



6. RFS-Replacing Fossil Fuel in Transportation

Status

 The total primary energy supply of oil in transportation sector continuously increases

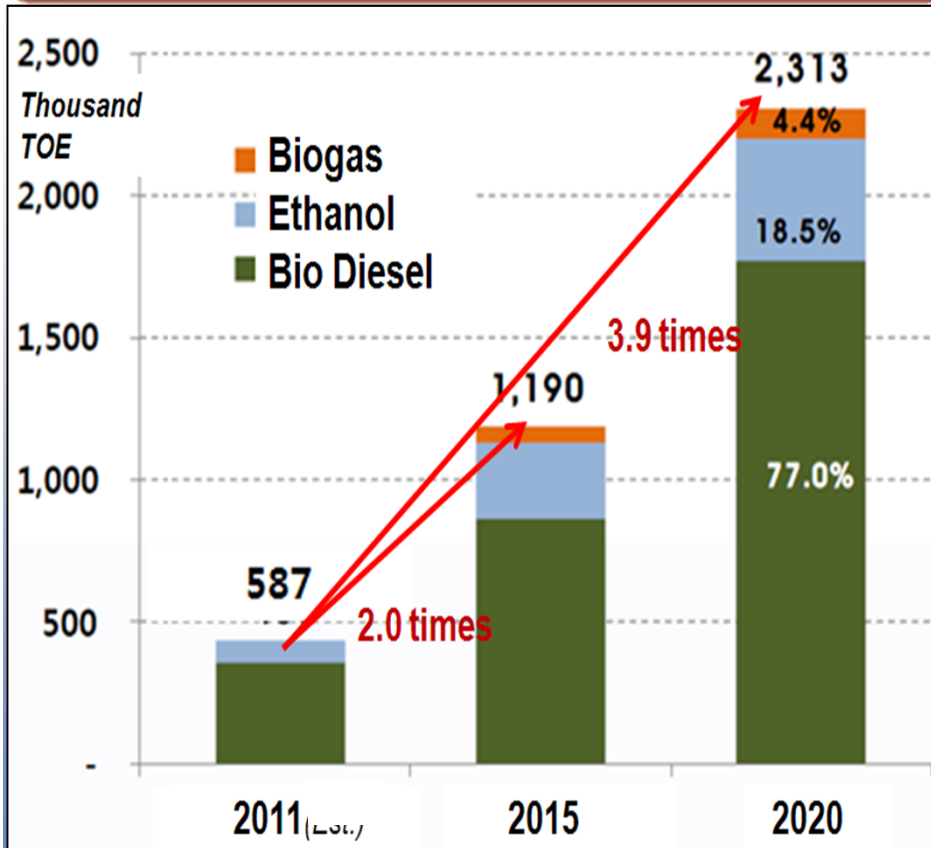


7. RFS-Expanding NRE Deployment

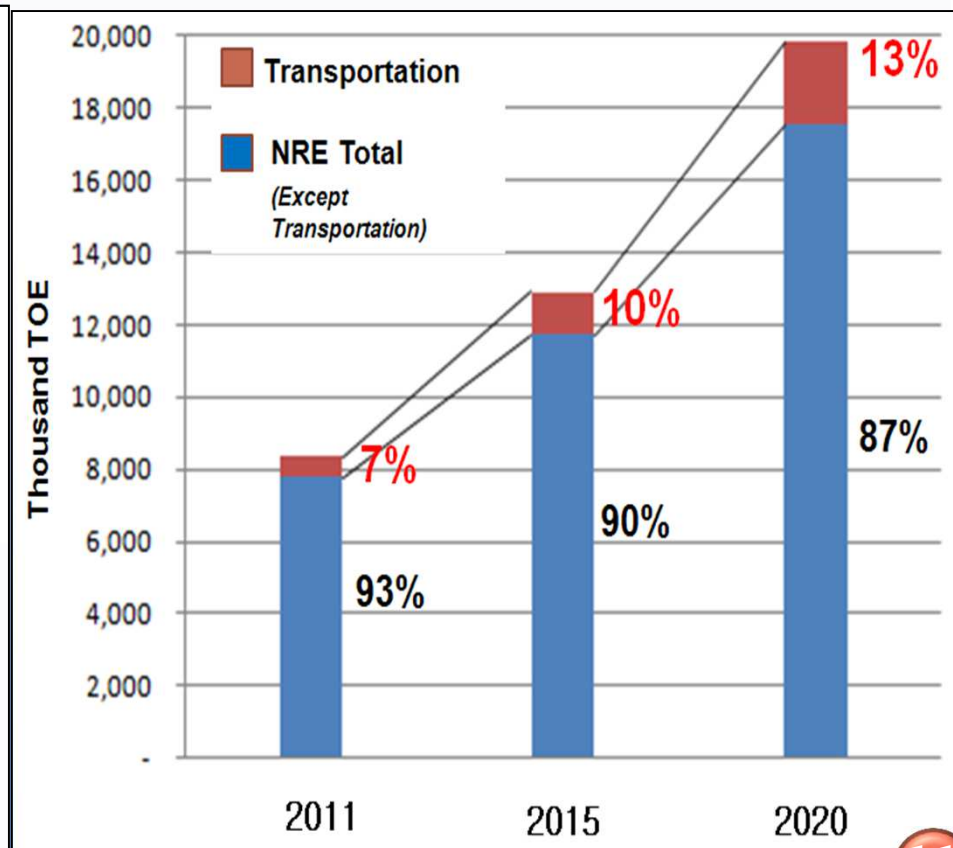
Target

The 3rd NRE Basic Plan(2008.12) [The 4th NRE Basic Plan to be announced in 2014]

Prospect of NRE deployment in transportation



Prospect of NRE share in transportation sector

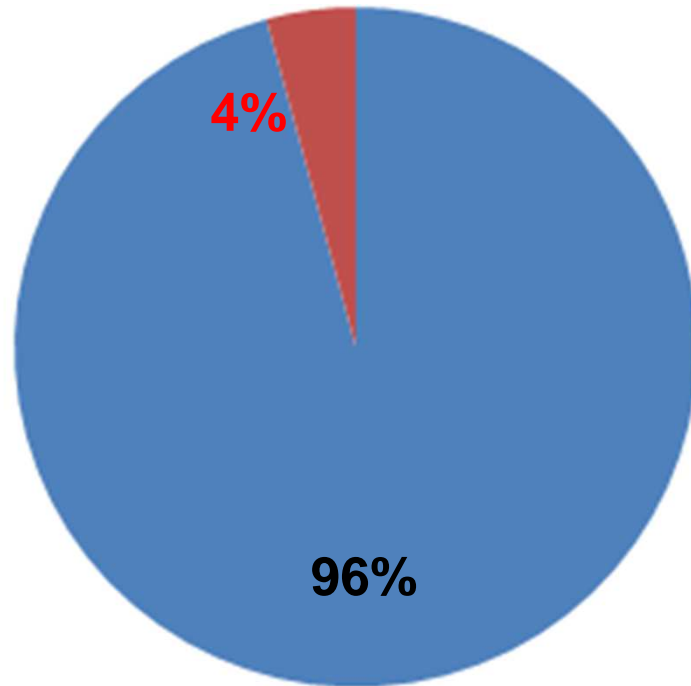


8. RFS-Expanding NRE Deployment

Status

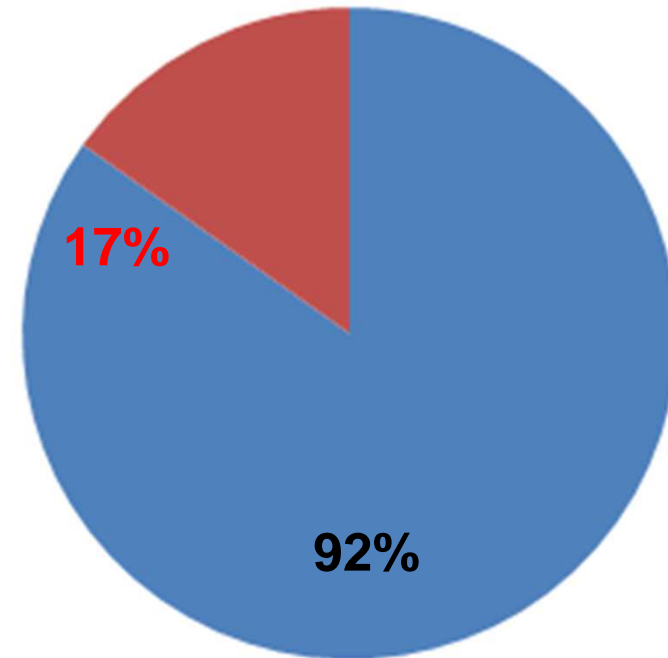
- The share of NRE utilized in transportation out of total NRE: 4% (2012)
- The share of energy utilized in transportation sector out of TPES: 17% (2012)

Share of NRE utilized in transportation (2012)



■ NRE ■ Transportation


Share of transportation in TPES (2012)



■ TPES ■ Transportation

9. Summary of Biodiesel Deployment Progress

Voluntary Mix

 **Induced voluntary usage of biodiesel by setting the mixing ratio of fuel-biodiesel and offering tax exemption incentive (tax credit) in 2007**

 Mixing Ratio(%) : ('07)0.5 → ('08)1.0 → ('09)1.5 → ('10)2.0 → ('11)2.0

** Established "The 1st Biodiesel Mid-and Long-term Deployment Plan 2007"*

Fuel-Biodiesel Mix Mandatory

 **Enforcing BD2 Mix Mandatory from 2012 (extermination of tax credit)**
(effective period: Jan.2012~Dec.2013)

** Amending "Notification of oil product quality standard and testing fees" (12.30.2011)*

Legislation and Amendment

 **Amend the law including implementation of RFS system**
(proclaimed in 30 July 2013 , will be enforced in 31 July 2015)

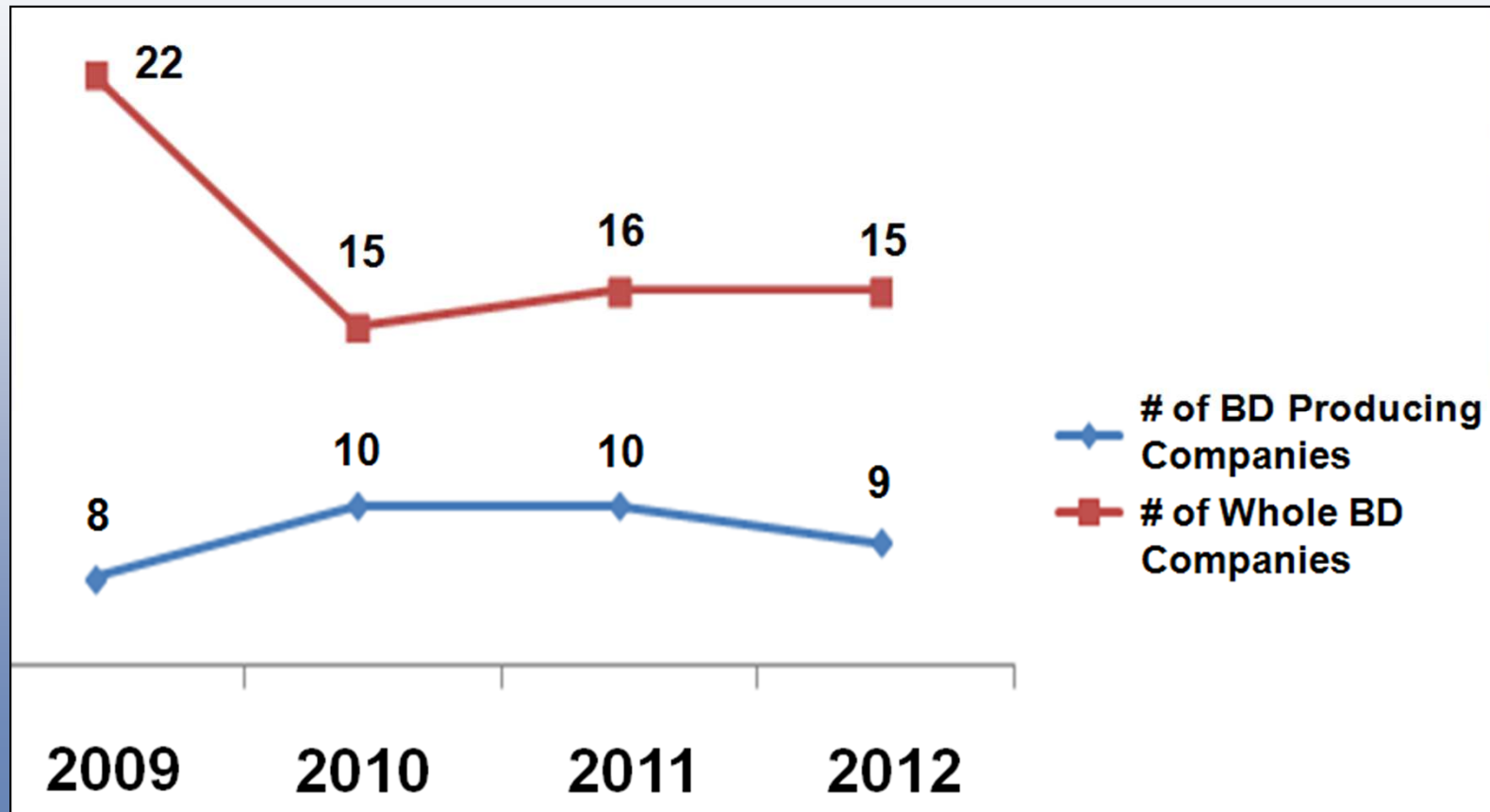
** Legislation and Amendment of "The Act on the Promotion of Development, Use, and Dissemination of New and Renewable Energy"*

10. Current Status of BD Deployment

Industry


BD Producing Companies(15), Total Capacity(1.2 Million kℓ) by 2013

- Sales to oil refinery companies
- 9 companies, Produced 0.52 Mil. kℓ, Domestic Sales 0.39 Mil. kℓ



11. Current Status of BD Deployment

Supply

 **0.11 Mil. kℓ**(2007) → **0.28 Mil. kℓ**(2009) → **0.389 Mil. kℓ**(2011) → **0.393 Mil.kℓ**(2013)
* Domestic Supply

(Unit: kℓ)

	2010	2011	2012	2013
BD20	345	326	158	150
BD2~5	394,836	388,913	397,697	393,000
Domestic	395,181	389,239	397,855	393,150
Export	-	27,281	54,457	129,000
Total	395,181	416,520	452,312	522,150

Ref: Korea Bio-energy Association

12. RFS Process(Tentative)

Process	Details
Obligator Report	<ul style="list-style-type: none"> [OBLIGATOR] Amount of domestic sales, importing plan report (Refinery Operator, Petroleum Export-Import Business Operator)
Selecting Obligation body & Set Up Ratio of Mixing	<ul style="list-style-type: none"> [Government Agency] Selecting Obligation body & Set up Amount [Government] Announcing Obligator & Mixing Ratio
Implementation of Duty	<ul style="list-style-type: none"> [Obligator] Implementation of Duty(Mixing Ratio)
Implementation Report	<ul style="list-style-type: none"> [Obligator] Monthly Report on Result of Amount of Mixing [Bio Fuel Producers] Report on the Amount of Bio Fuel Supply
Evaluation	<ul style="list-style-type: none"> [Government Agency] Verification Performance Using Data from Obligators' Report, KNOC etc and Physical Inspection
Penalty	<ul style="list-style-type: none"> [Government Agency] Penalty Assessment [Government] Decision of Imposing a Fine [Obligators] Submit Explanatory Materials or Paying a Fine

IV

Status Update of RPS



13. Renewable Portfolio Standard(RPS)

Overview

- Enforces 14 power producers to supply certain amount of the total Power generation by NRE (Implemented in 2012)
 - ※ Obligators: power producers with capacity of 500MW or above



Goal and Current Status

- Goal : ('12) 2.0% → ('13) 2.5% → ('14) 3.0% → ('17) 5.0% → ('20) 8.0% → ('22~) 10.0%
- Current Status : RPS achieved 1.7 times of total FIT installed capacity (proceeded for 10 years) in 2 years

RPS('12~'13)	FIT('02~'11)	Rate of change
1,751MW (Solar PV 589MW)	1,030MW (Solar PV 497MW)	170.0%↑(Solar PV 118.5% ↑)

Best Practice

- Converting rooftop of the factory and parking lot into Solar PV Power Plant (Busan) (2013)
 - The largest Solar PV Plant for the single factory utilized existing facilities in the world (20MW, Renault Samsung Motors)
 - Generated electricity(26GWh/yr.) provides 7,300 households
 - * Ave. usage rate 15%, 1 household uses 300kWh/month



Thank You

KOREA ENERGY MANAGEMENT CORPORATION

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