



**Asia-Pacific
Economic Cooperation**

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New and Renewable Energy in Korea - Best Practices in Policy and Deployment

Purpose: Information
Submitted by: Korea



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New and Renewable Energy in Korea

- Best Practices in Policy and Deployment -

March. 2017

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Korea Energy Agency(KEA)



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II Main Policies and Strategies in NRE

**NRE: New and Renewable Energy*





The Status of New & Renewable Energy in Korea



1. NRE Target – The 4th NRE Basic Scheme

Primary
Energy

Target Rate: **11.0%** (2035)

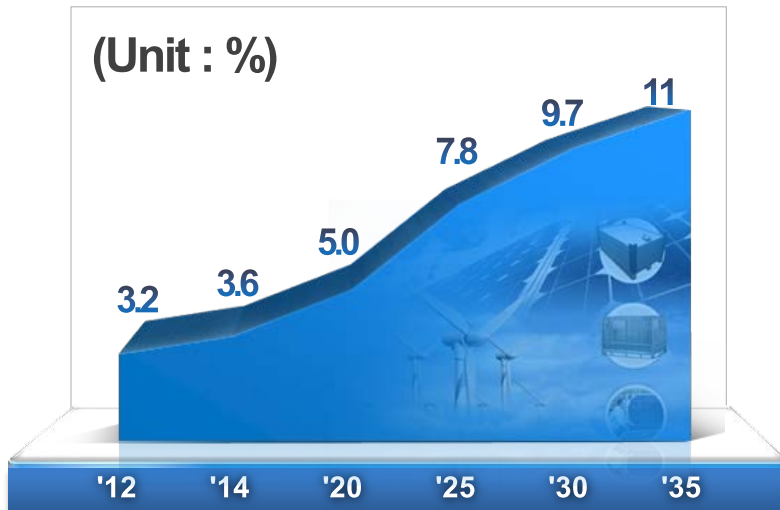
Annual NRE growth rate between 2014 and 2035: 6.3% > Annual demand rate of primary energy: 0.7%

Electricity

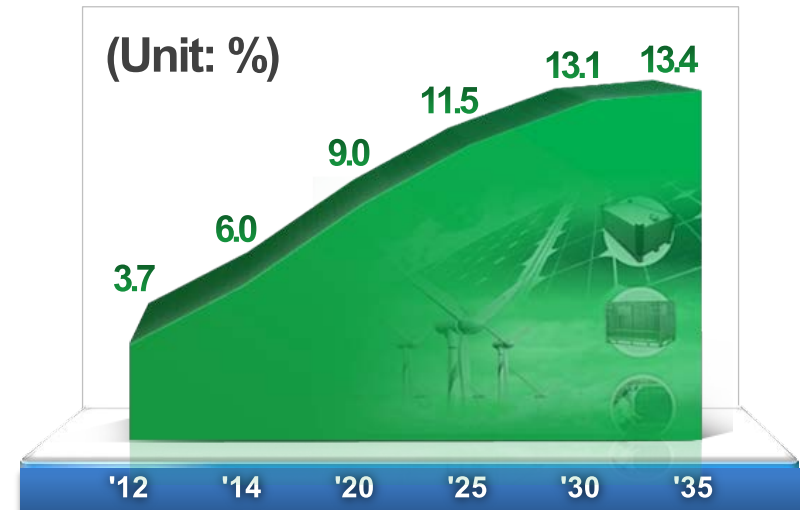
Target Rate: **13.4%** (2035)

Annual NRE growth rate between 2014 and 2035: 5.8% > Annual demand rate of electricity: 1.8%

NRE share targets based on primary energy

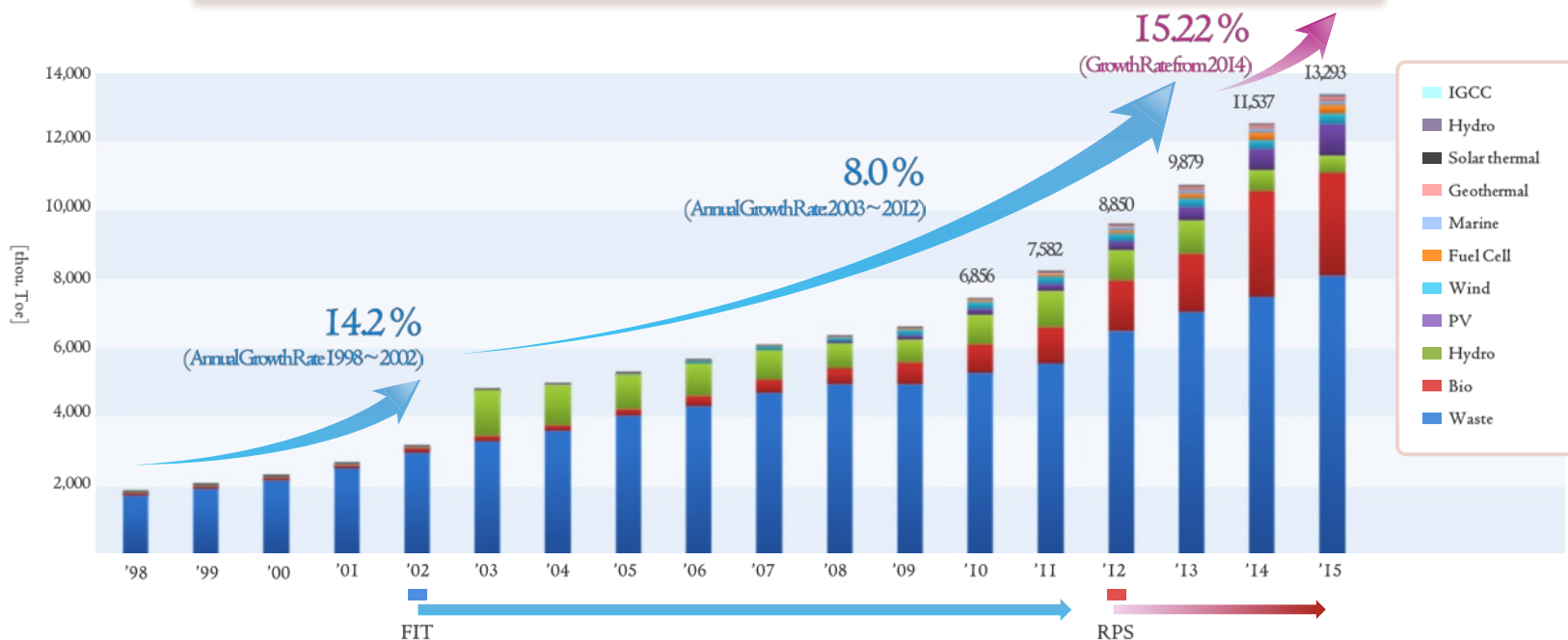


NRE share targets based on power generation capacity



2. The Status of NRE Industry

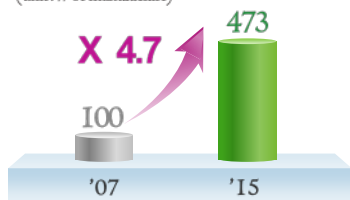
Trend of Supply



Status of NRE Industry

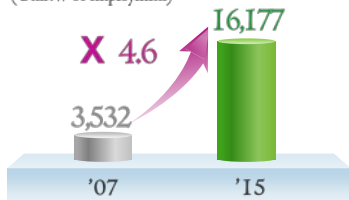
Companies

(unit: # of manufacture)



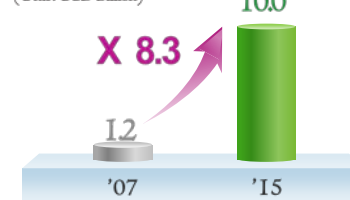
Employment

(Unit: # of employment)



Sales

(Unit: USD Billion)



Export

(Unit: USD Billion)



3. PV & Wind Value Chain in Korea

PV



Wind



4. NRE Strategies Scope

Target (~ 2035)

NRE Shares in TPES by 11% (4.62% in 2015)

* 4th New & Renewable Energy Basic Plan (Sep. 2014)



- ▶ R&D Project
- ▶ Pilot Project
- ▶ International-Cooperation R&D



- ▶ Certification
- ▶ Standardization
- ▶ Capacity Building



- ▶ Subsidy Programs
 - Home & Building
 - Regional
- ▶ Renewable-Portfolio-Standards
- ▶ Mandatory for Public Building
- ▶ Renewable Fuel Standard
- ▶ Loan/Tax Incentive
- ▶ PV Rental Program

|| Main Policies and Strategies in NRE



5. Main Policies and Strategies in NRE

Category	Sector	Tools	Programs
NRE Deployment Program	Private Sector	Subsidy	Home Subsidy Program (1 Mil. Green Homes)
			Building Subsidy Program
			Feed-in-Tariffs (FIT) (<i>Ended but lasting 15-20 years</i>)
			Overseas Business Support
		Loan	Financial Support(Installation, Production, Operating Capital, Solar Agricultural Villages)
		Mandatory	Renewable Portfolio Standard (RPS: 4.0%('17) →10%('23~))
			Renewable Fuel Standard (RFS: 2.5%('15-'17)→3%('18-'20))
	Business	Solar PV Rental Program	
	Public Sector	Subsidy	Regional Deployment Program
			Eco-Friendly Energy Town
			Combined Support Program
Establishment of NRE Test-bed			
Mandatory		NRE Mandatory Use for new or renovated Public Buildings(21%('17)→30%('20))	
Infrastructure -building Program	Private & Public Sector	-	Certification, Standardization, and International Cooperation
			R&D(Policy and Regulation)

6. Renewable Portfolio Standard(RPS)

Overview

- Enforces 18 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% →...→ ('16) 3.5% → ('17) 4.0% → ('18) 5.0% →...→ ('20) 6.0% →...→ ('23~) 10.0%
- Current Status : RPS achieved 7.3 times of total FIT installed capacity(proceeded for 10 years) in 5 years

RPS('12~'16)	FIT('02~'11)	Rate of change
7,555MW (Solar PV 3,289MW)	1,030MW (Solar PV 497MW)	633.5%↑(Solar PV 561.8% ↑)

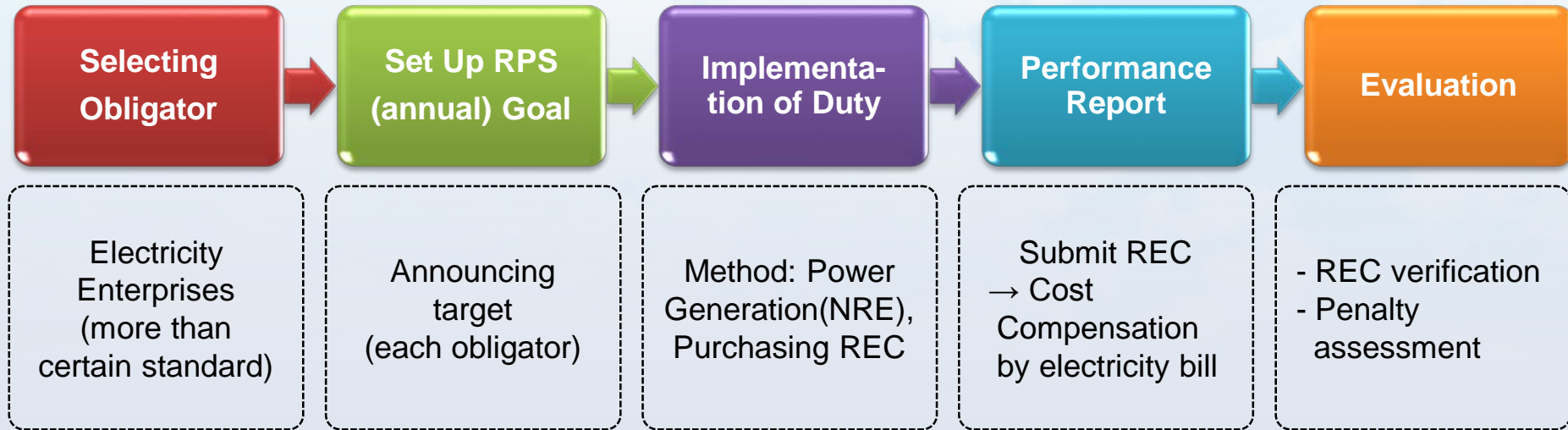
Best Practice

- Converting rooftop of the factory and parking lot into Solar PV Power Plant (Busan)
 - 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



6-1. Renewable Portfolio Standard(RPS)

Process

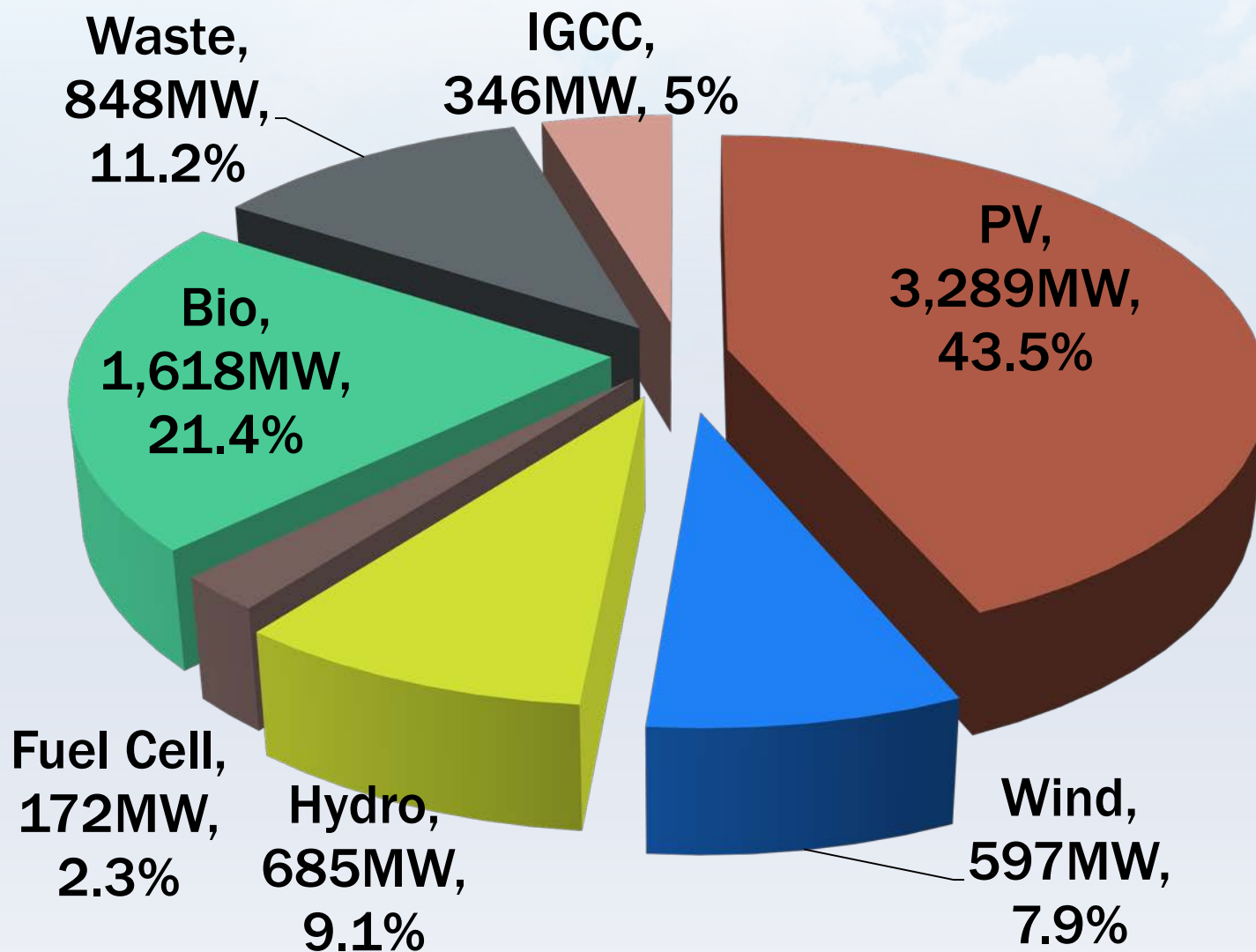


- Obligor should prove its Implementation of duty by submitting REC
 - Direct acquiring REC (Installation & Generation)
 - Indirect acquiring REC (Purchasing REC in the market)
- For the amount of unimplemented, levy penalty (within 150% of avg. trading price for each REC)

* REC: Renewable Energy Certificate

6-2. Renewable Portfolio Standard(RPS)

Total Capacity(MW)



6-3. RPS – REC & Multipliers

Evaluation Criterion

- Economic feasibility, Environmental effect, Potential, Industrial promotion effect, Policy priority

(Govnt. Revises every 3 years)

Energy Source	Multiplier	Eligible Energy Sources	
		Installation Type	Detail
Solar PV	1.2	On Land	Less than 100kW
	1.0		More than 100kW
	0.7		Exceed 3,000kW
	1.5	On Building & Existing Facilities	Under 3,000kW
	1.0		Exceed 3,000kW
	1.5	Floating on the Water Surface	
	1.0	Self-generating Facilities	
	5.0	ESS(with Solar PV Facility)	2016, 2017
Other REs	0.25	IGCC, Byproduct Gas	
	0.5	Waste, LFG	
	1.0	Hydro, Onshore Wind, Bioenergy, RDF Combustion (全焼) Power, Waste Gasification Power, Tidal(潮力) (with Embankment, 防潮堤), Self-generating Facilities	
	1.5	Lignocellulosic Biomass Combustion (全焼) Power, Off shore wind(less than 5km connecting distance)	
	2.0	Fuel Cell, Current Power(潮流)	
	2.0	Offshore Wind(more than 5km connection distance), Geothermal, Tidal(潮力)(without Embankment, 防潮堤)	Fixed Type
	1.0 ~ 2.5		Variable Type
	5.5	ESS(with Wind Facility)	2015
	5.0		2016
	4.5		2017

7. PV Rental Program

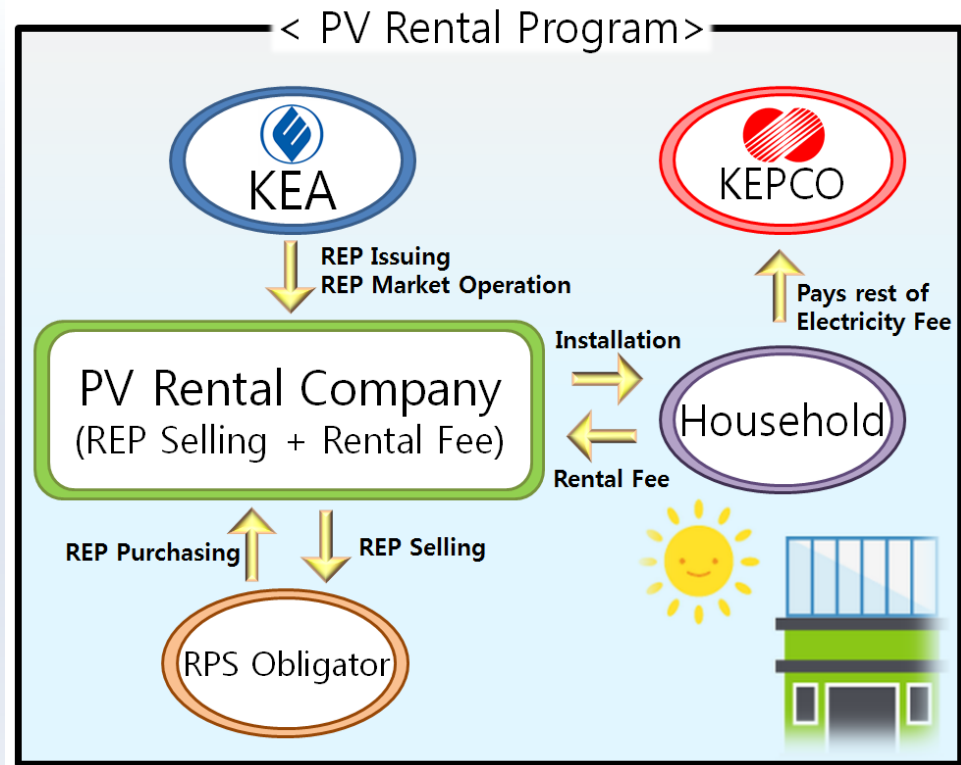
Overview

Household owners pay electricity bill as under 80% of ave. Electricity bill, PV Rental companies earn rental fee and benefit from REP selling

※ *REP: Renewable Energy Point(No Multipliers applied)*



Year	2013	2014	2015	2016
Number of Rental companies	3	4	6	8
Number of Households	60	2,006	8,796	10,362
Capacity (kW)	180	6,018	8,569	7,971
TARGET By 2030	0.4 mil households			



8. Solar Agricultural Villages

Overview

- To help increasing income of farmhouse with expending PV deployment
- Target : 10,000 farmhouses by 2020
- Budget : USD 10 mil as loan program(in 2017)

Process

Related Ministries
(Government & Budget)



Korea Energy Agency
(Verify & Recommendation)

- Promotion & Education
- Feasibility Support
- Permission Support
- Loan Recommendation



Agricultural Bank
(Loan & Others)

- Permission Support
- Loan
- Selecting EPC contractor
- REC Trading Support

Expected result

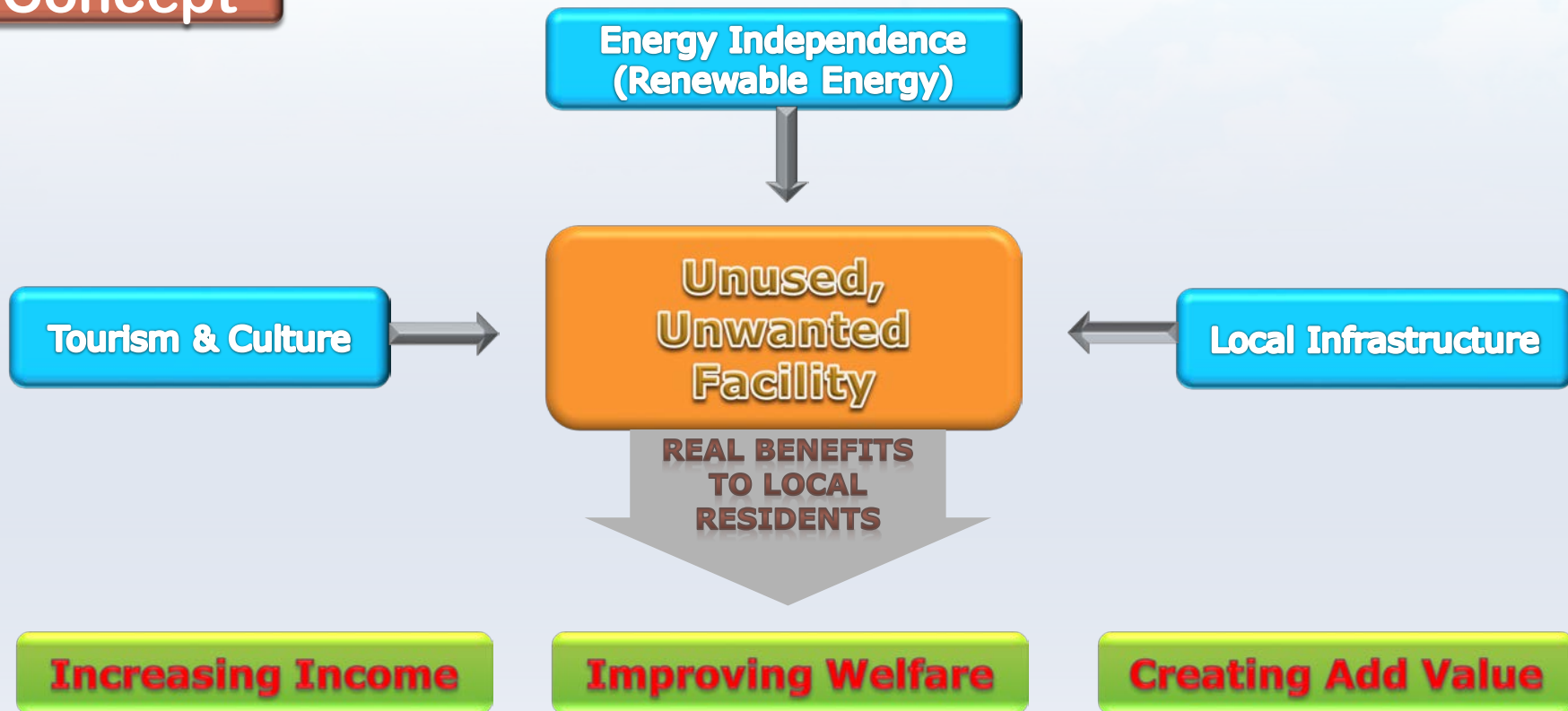
- Increasing of Farmhouse income(USD 1,000/month), RE deployment, Job creation

9. Eco-Friendly Energy Town

Overview

- To provide real benefits to local residents as increasing income, elevating welfare by installing Renewable energy system on unused & unwanted facilities.

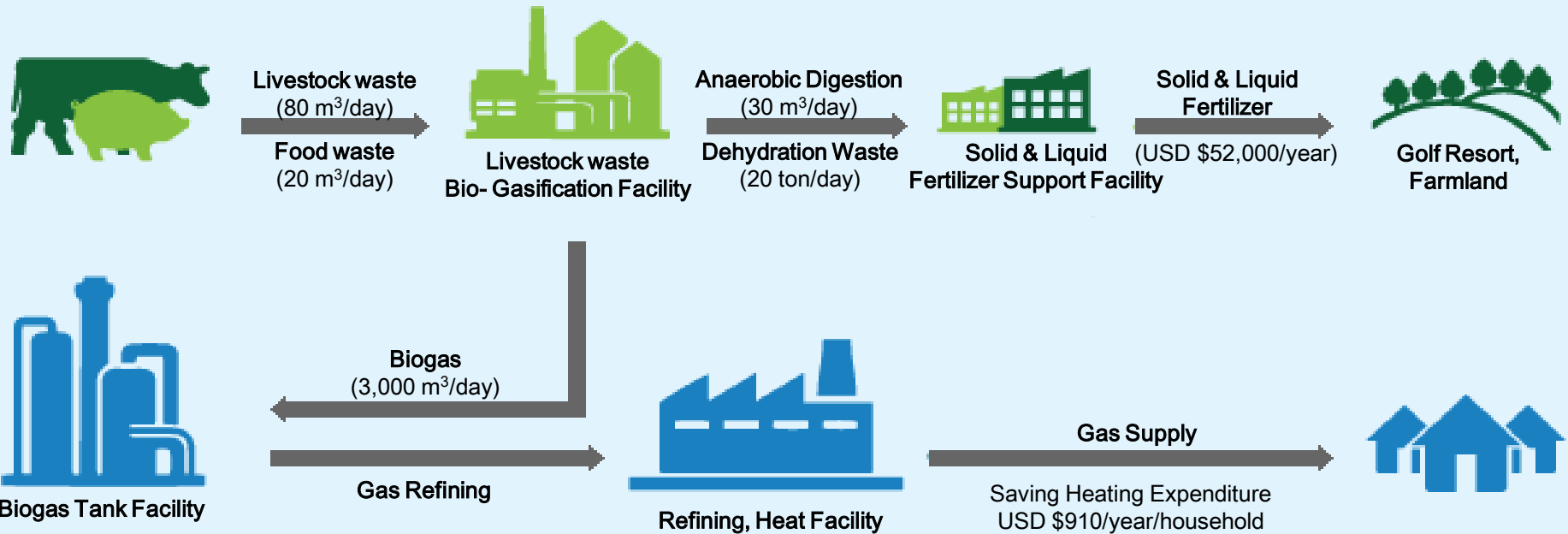
Concept



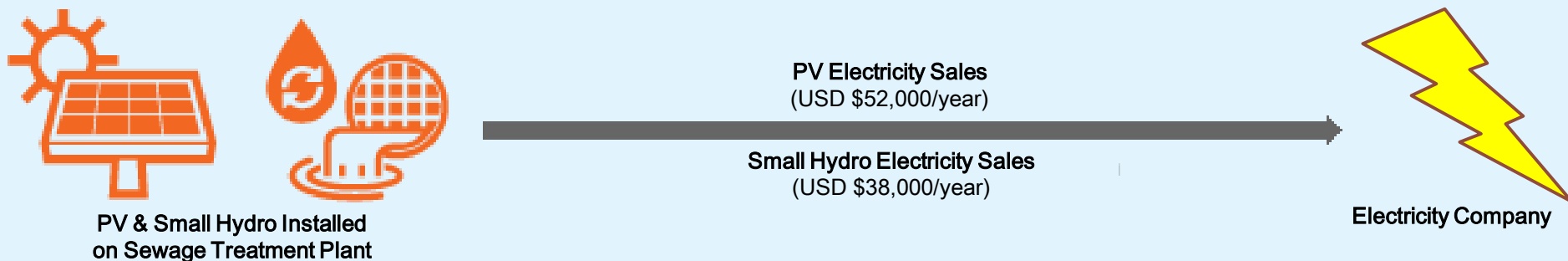
9-1. Eco-Friendly Energy Town(Korea)

Best Practice – Hong Chun

Utilising Livestock & Food Waste to Fertilizer & Citygas



Improving Income of Residents by selling RE Electricity installed on Sewage Treatment Plant



9-2. Eco-Friendly Energy Town(Abroad)

Ethiopia

Energy Independent Eco-Friendly Energy Town
(PV 250kW, Biomass 30kW, ESS 1MWh, Microgrid)

- MoU(May. 2016) : MOTIE(KR)-Vice Minister of Economic Cluster(ET)
- Korean Delegation to Ethiopia Site Survey(Jun. 2016)
- Project Concept Paper(PCP) received(Aug. 2016)
- Feasibility Study/ODA Budget approved/Koftu



Mongolia

Mine Damage Restoration Eco-Friendly Energy Town
(PV 300kW, Small Wind 100kW, ESS 900kWh, Microgrid)

- MoU(Jul. 2016) : MOTIE(KR)-MOE(MN)
- Korean Delegation to Mongolia Site Survey(Aug. 2016)
- Project Concept Paper(PCP) received(Aug. 2016)
- Feasibility Study / ODA Budget approved / Nalaikh



Lao PDR

Energy Independent Eco-Friendly Energy Town (PV, Mini Hydropower, Microgrid)

- MoU(Sep. 2016) : MOTIE(KR)-MEM(LA)
- Korean Delegation to Laos Site Survey(Sep. 2016)
- Feasibility Study is on conducting

Thank You



KOREA ENERGY AGENCY
New & Renewable Energy Center

