An Overview of Bioenergy Policy and Market in Korea

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Presentation Agenda

I. Introduction

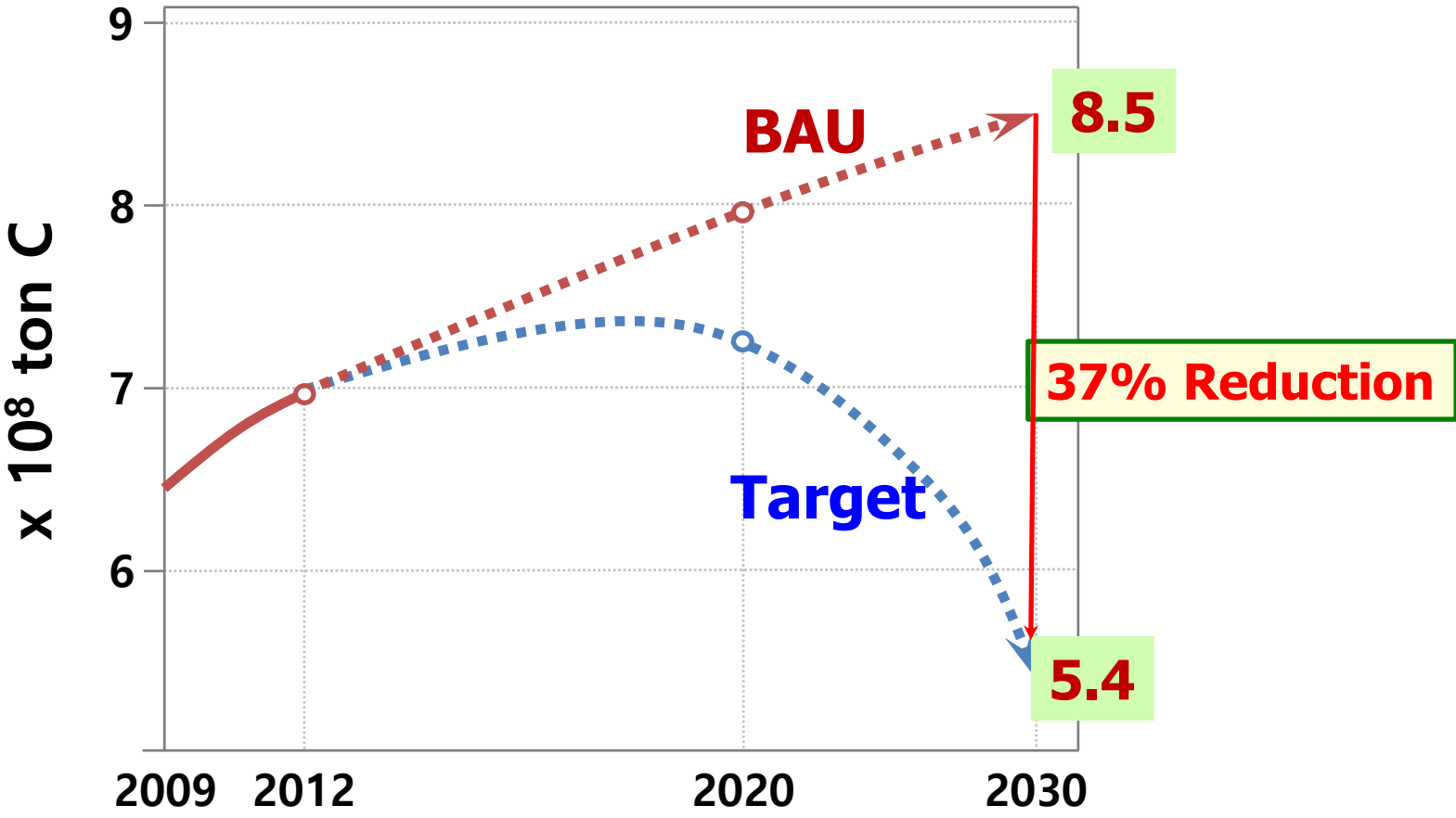
II. Current Status on Bio-power

III. Prospects on Bio-power

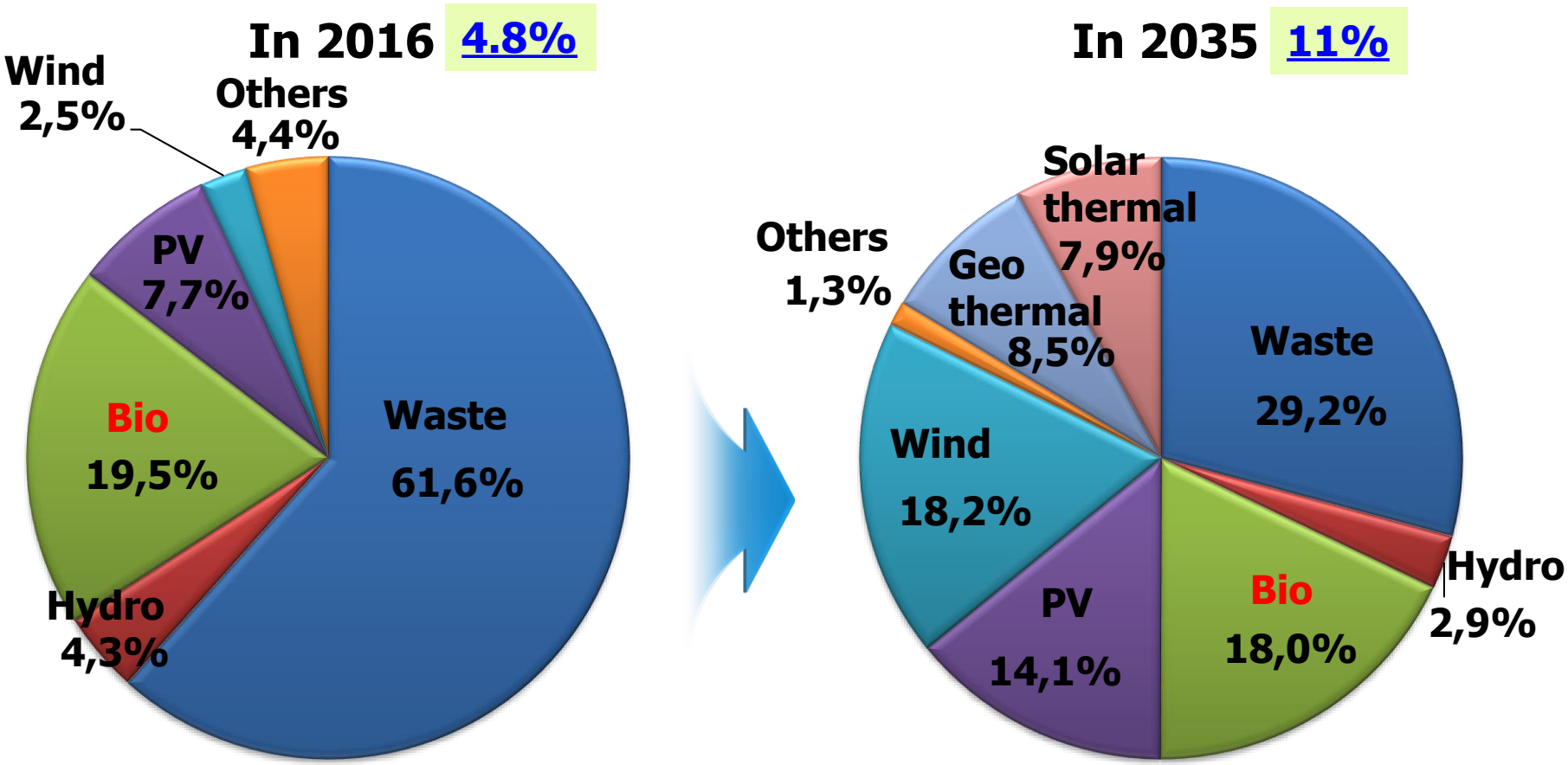
IV. Summary

I. Introduction

CO_2 Reduction Plan in Korea
(MOE, 2015)



Targets for Renewable Energy
(4th New and Renewable Energy Plan, 2014)



x 2.55

Renewable energy : 1.42 x 10^7 TOE ----------→ 3.62 x 10^7 TOE

x 2.04

Bioenergy : 2.76 x 10^6 TOE ----------→ 5.65 x 10^6 TOE

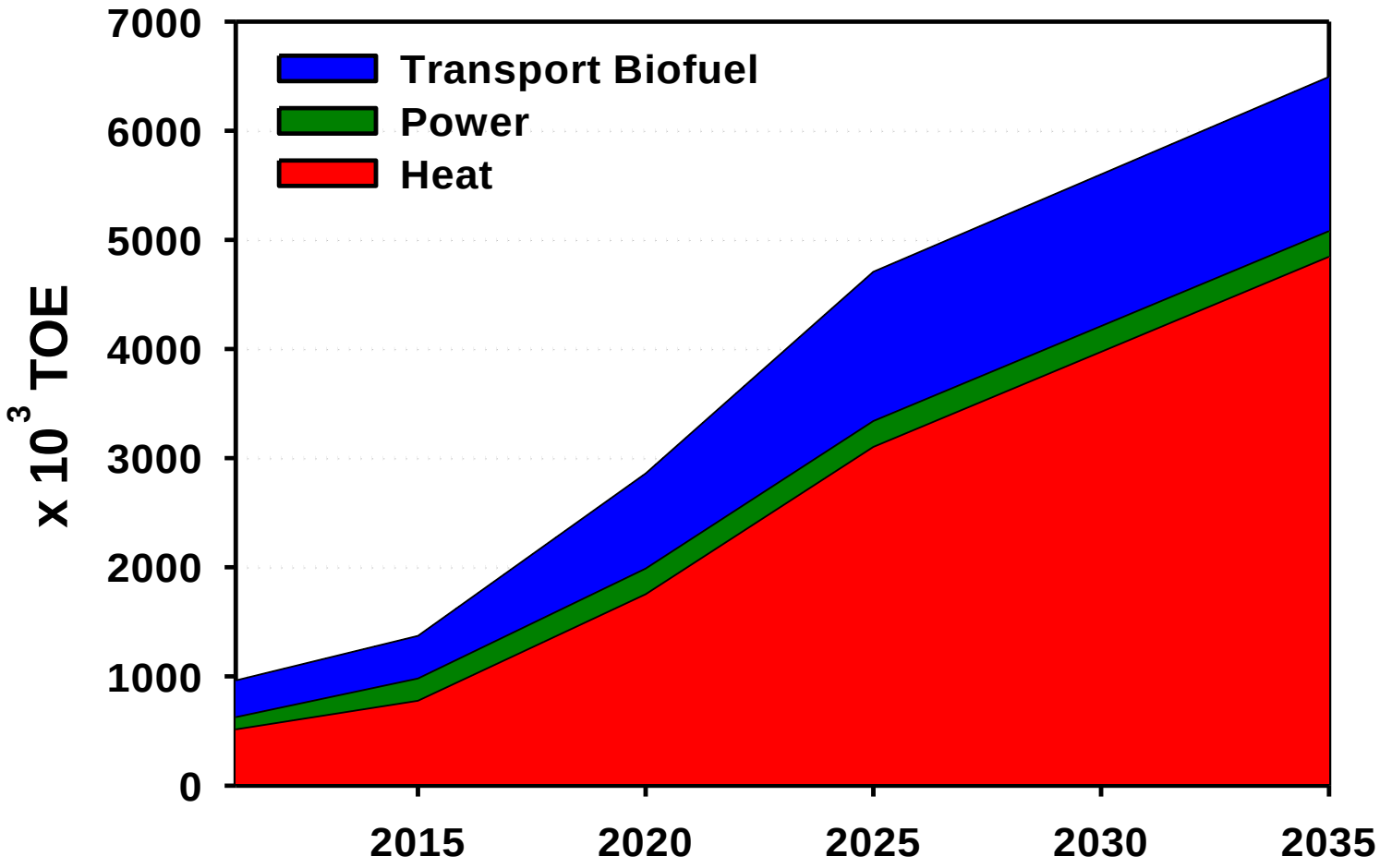
II. Currents Status on Biopower

Supporting Policies on Bioenergy

Bioenergy	Supporting Policy
Bio-power	Feed-in-Tariff ----→ RPS (from 2012)
Biofuels	Tax exemption ---→ RFS (from 07. 2015)
Bio-heat	Renewable Heat Obligation (RHO) (???)

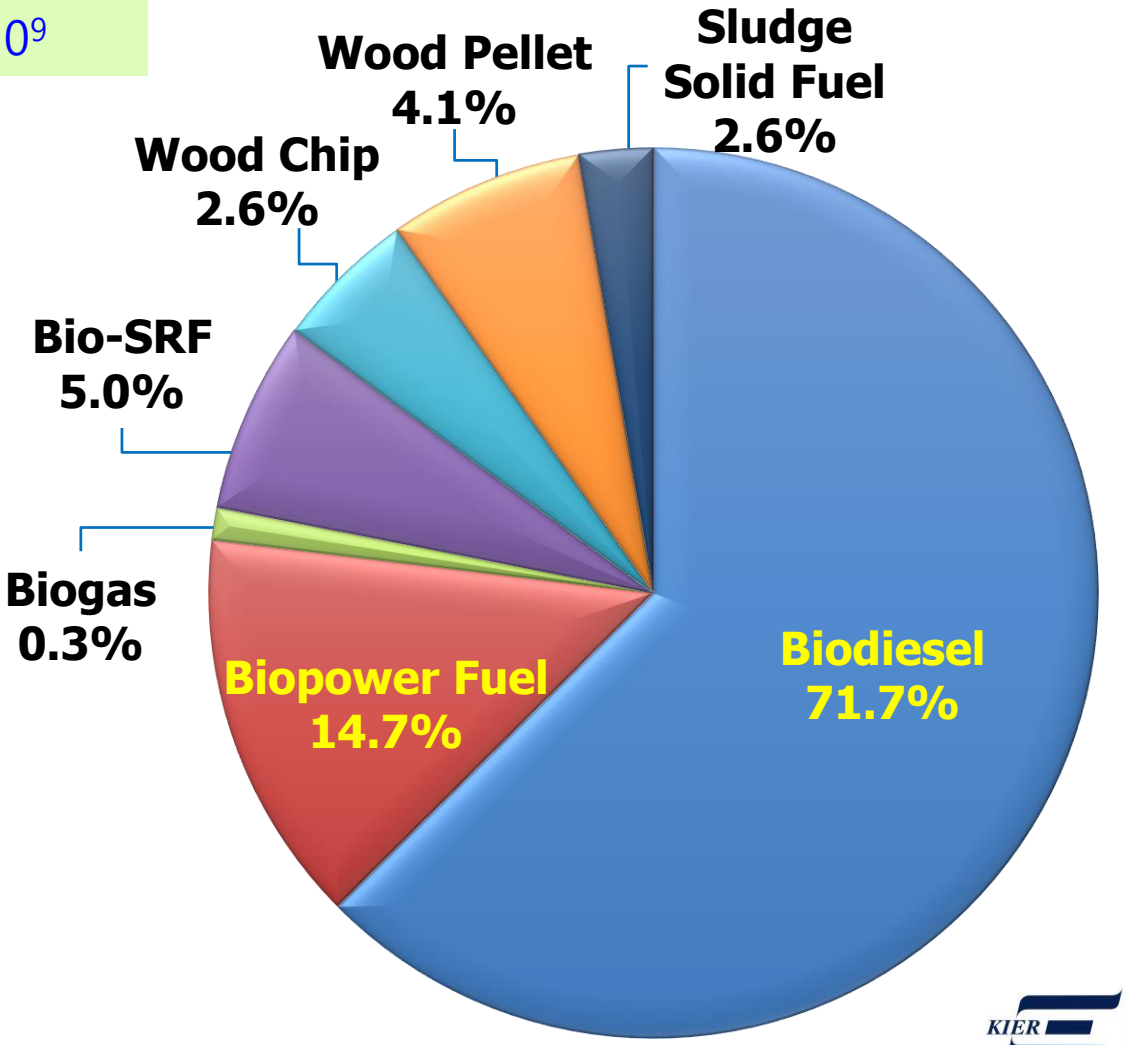
Status and Targets of Bioenergy Supply by Type

(KNREC, 2014)



Bioenergy Market in Korea
(KNREC, 2017)

2016: $1.0 x10^9



RPS Target
(KNREC, 2018)

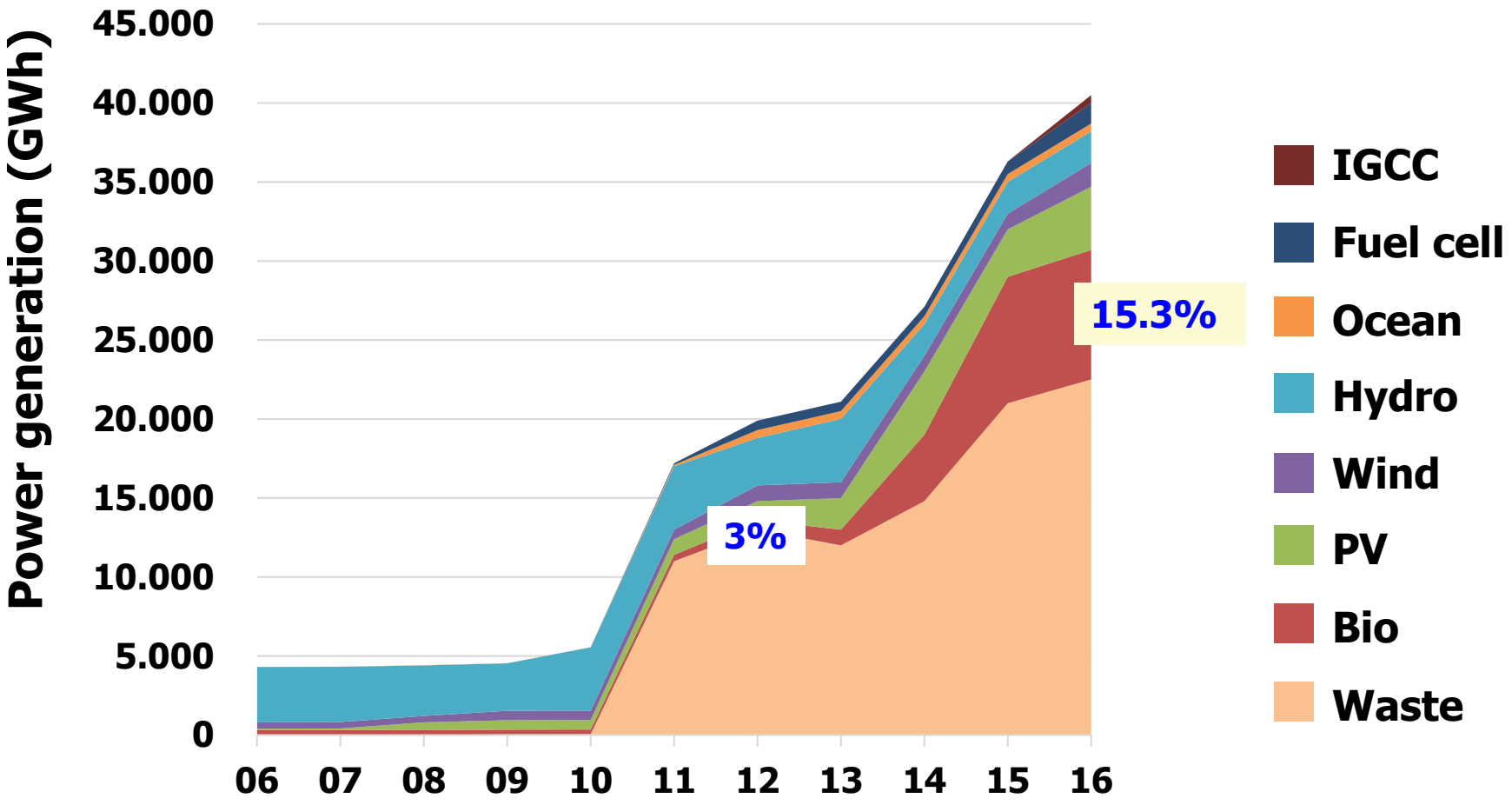
Program participants: Power producers having capacity > 500MW (21 power companies)

Year	2012	2013	2016	2018	2020	2022	2024
RPS Target, %	2.0	2.5	3.5	5.0	7.0	9.0	10.0
Liability, (No. of certificates) x 10^3 RECs	6,420	9,210	15,081	21,999	-	-	-
Bio-power	60 (0.9%)	724 (7.9%)	2,081 (13.8%)	?			

In 2018, REC prices

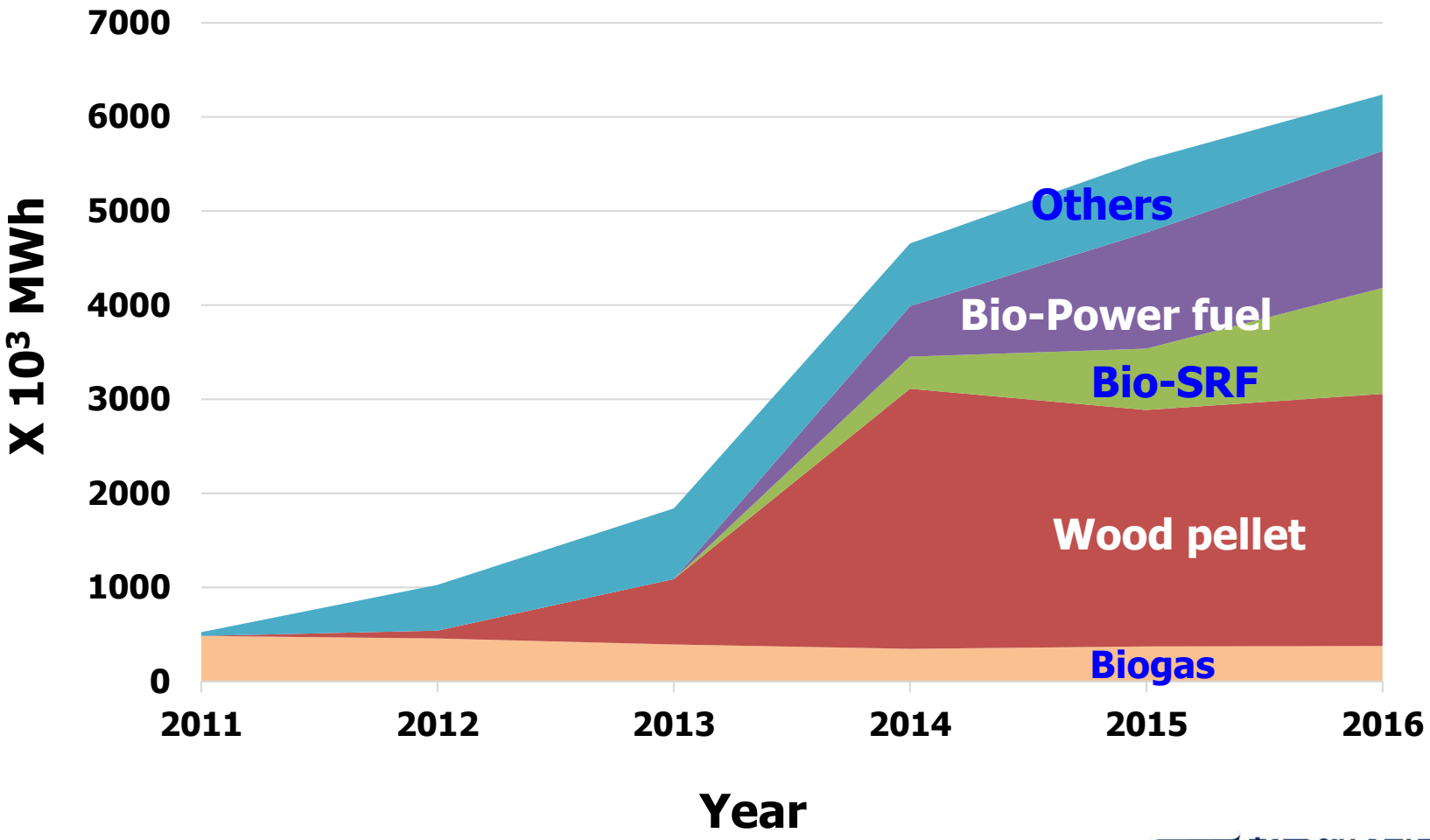
- **Contract : $66/REC**
- **Spot trading : $90/REC**

Renewable Generation by Technology
(KNREC, 2018)



Bio-Power by Fuel type

(KNREC, 2017)

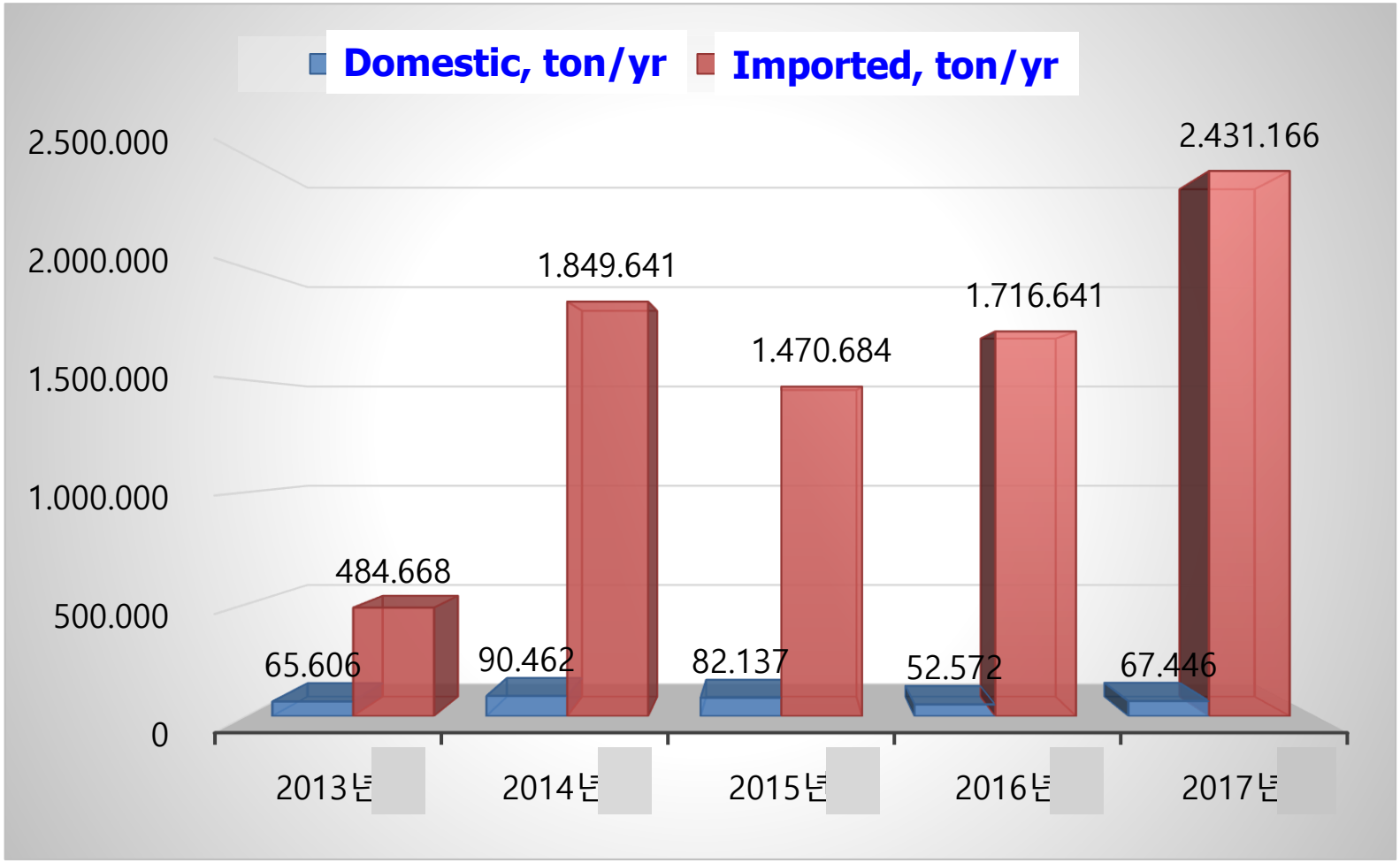


Advantages of Bio-power

- **Easy adaption to existing power plants**
- **Low investment cost**
- **Low entry barriers**
- **High REC credit until 2018 May**

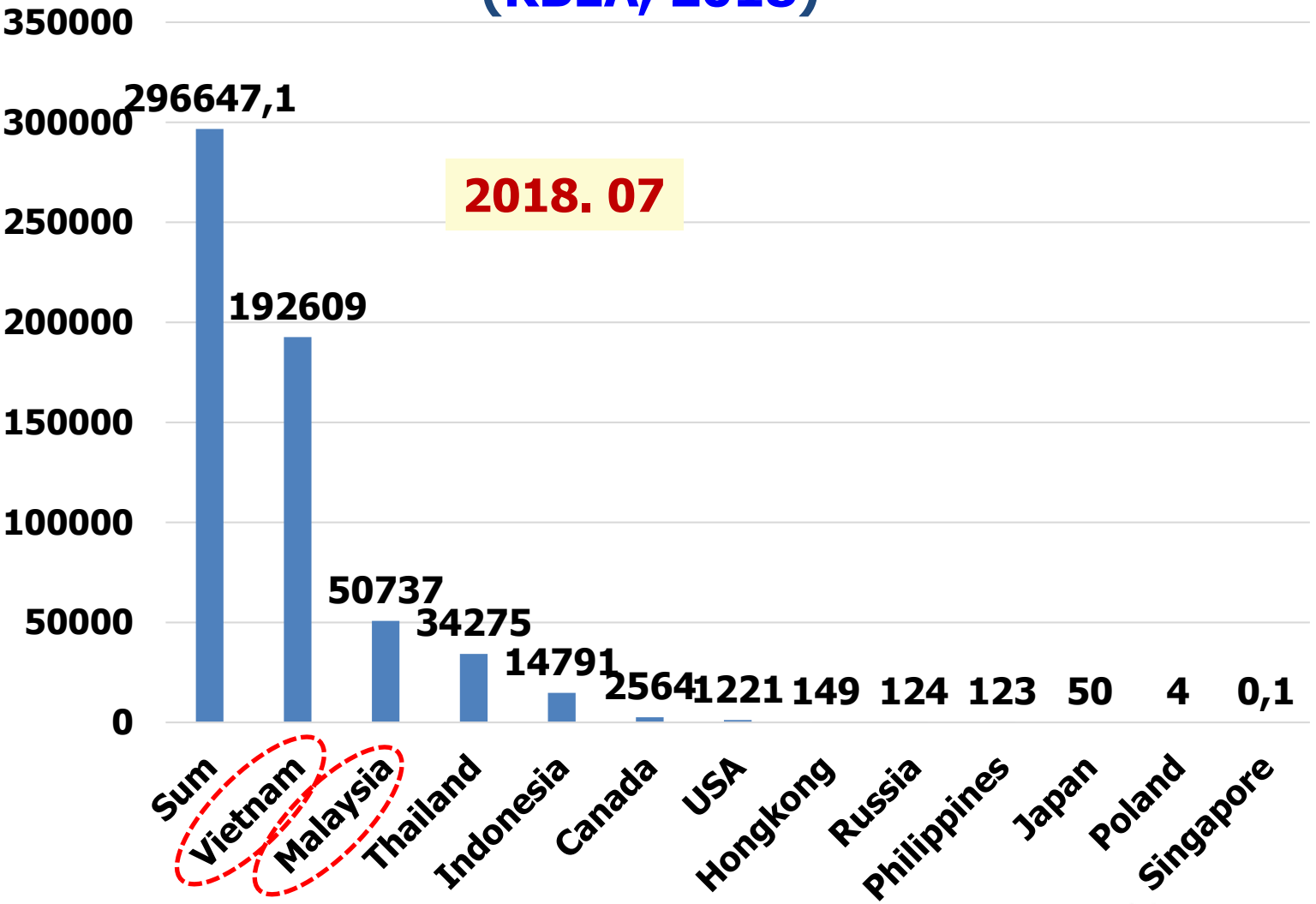
Renewable energy type		REC Credits
Bio	Co-firing	1.0
	Dedicated	1.5
PV		0.7-1.5
Wind	On-shore	1.0
	Off shore	1.5-2.0

Wood Pellet Consumptions in Korea
(KBEA, 2018)



Major Countries for Pellet Export to Korea

(KBEA, 2018)



Challenging Issues on Bio-Power

- **High dependence on imported pellets**
  (55% of bio-power is from imported pellets)

- **Concern about air pollution by PM emissions**

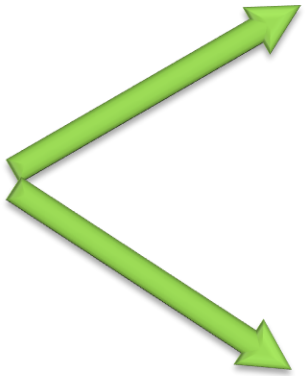
Notice for REC changes, Biopower

(MOTIE public hearing, May 18th 2018)

Fuel	Technology	New REC , Equivalence value
LFG	-	0.5
Wood chip/ Wood pellet	Co-firing	1.0 ---→ 0
	Co-firing -→Dedicated	1.0 -→ 0.5
	Dedicated	1.5 ---→ 1.0
Bio-SRF	Co-firing	1.0 ---→ 0
	Co-firing -→Dedicated	1.0 --→ 0.25
	Dedicated	1.5 --→ 0.5
Unutilized Forest residues	Co-firing	1.0 ---→ 1.5
	Co-firing -→Dedicated	1.0 ---→ 2.0
	Dedicated	1.5 ---→ 2.0
Bio-power fuel, Sludge fuel	-	1.0

Unutilized Forest Biomass in Korea

Cutting volume
9.40×10^6 m^3



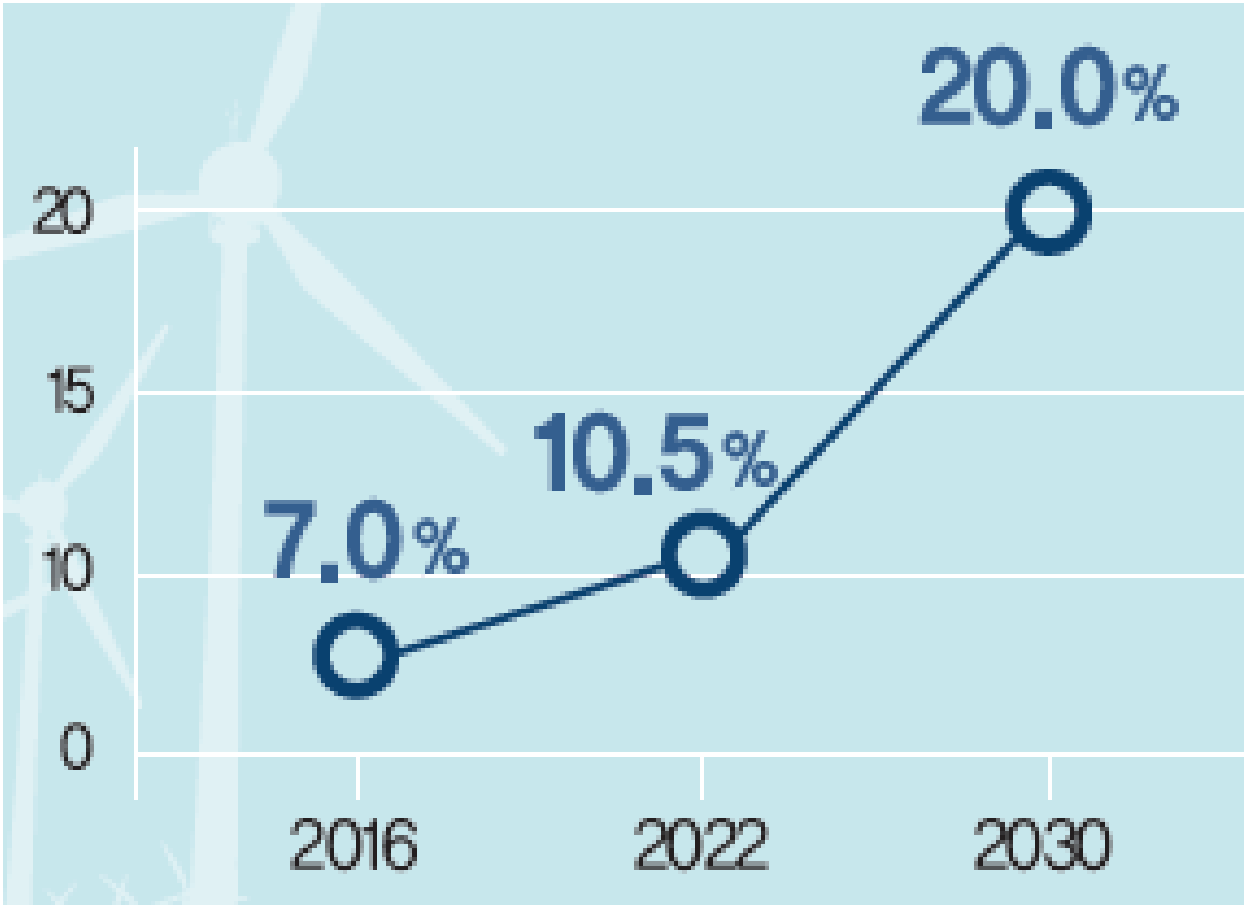
Utilized
5.15×10^6 m^3

Unutilized
4.15×10^6 m^3

Logistics for collection of unutilized forest residues is the key issue!

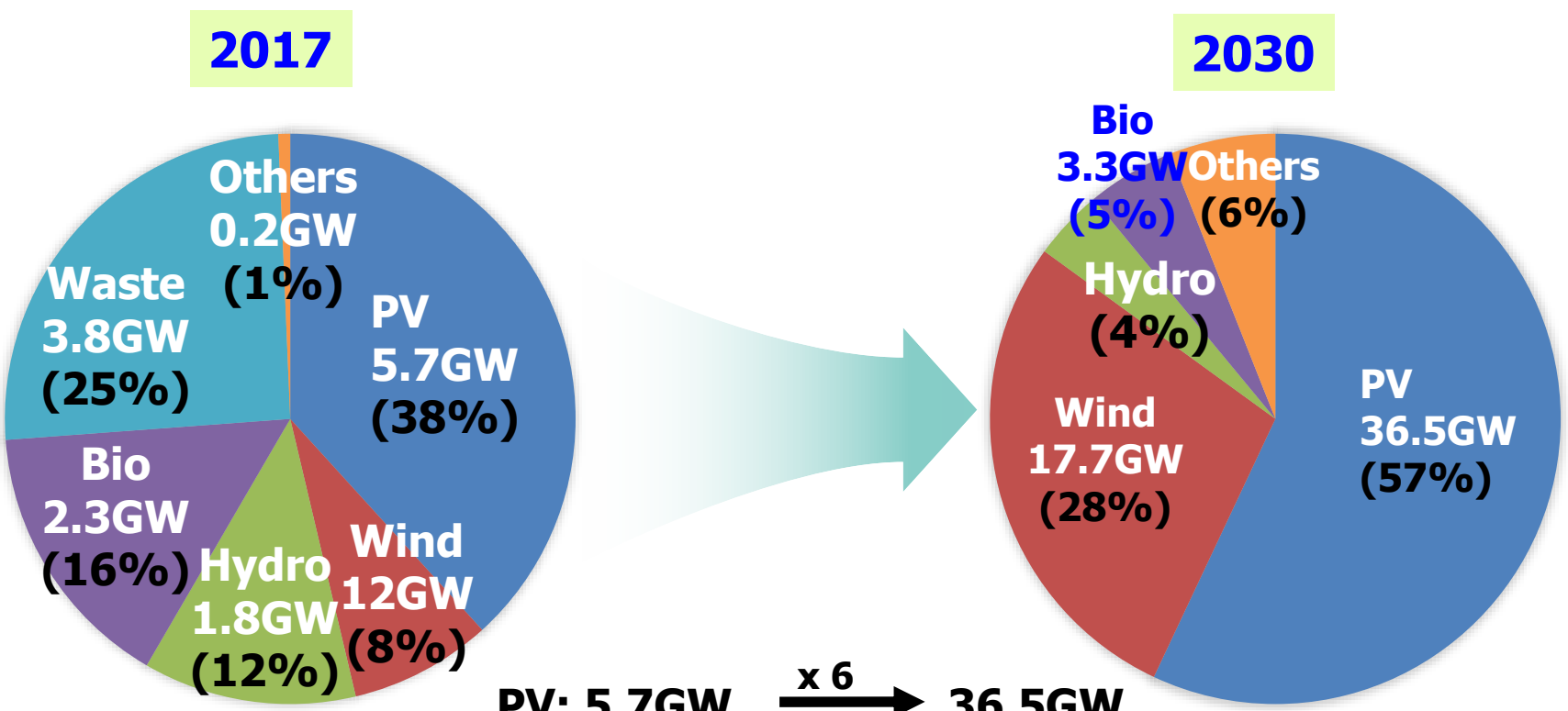
III. Prospects on Biopower

RE 3020 plan
(MOTIE, 2017)



Action plan of RE 3020
(MOTIE, 2017)

PV, Wind will be key renewable energies for RE3020



PV: 5.7GW → (x 6) → 36.5GW

Wind: 12GW → (x 15) → 17.7GW

Bio: 2.3GW → (x 1.4) → 3.3GW

IV. Summary

1. Ambitious CO_2 reduction plan is the main driver for implementation of renewable energies including bioenergy
2. RPS is the main supporting policy for biopower
3. Wood pellet has been the most attractive option for power companies to reach the RPS target
4. Bio-wastes and forest residues are the main sources for bioenergy. Shortage of the feedstocks for bioenergy becomes the main issue
5. Korean government now more focus on PV and wind
6. Currently sustainability of bioenergy is not officially considered

Thank You
for Kind Attention!