



# Korea's RE100 Vision and Job Creation

Hong, Jong Ho  
Kim, Boram  
Lee, Soim  
Lim, Jaemin  
Yangyi, Wonyoung

# Korea's RE100 Vision and Job Creation

- I. Background
- II. Issues in Renewable Jobs Statistics
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- IV. Renewable Energy and Job Creation
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# I. Background

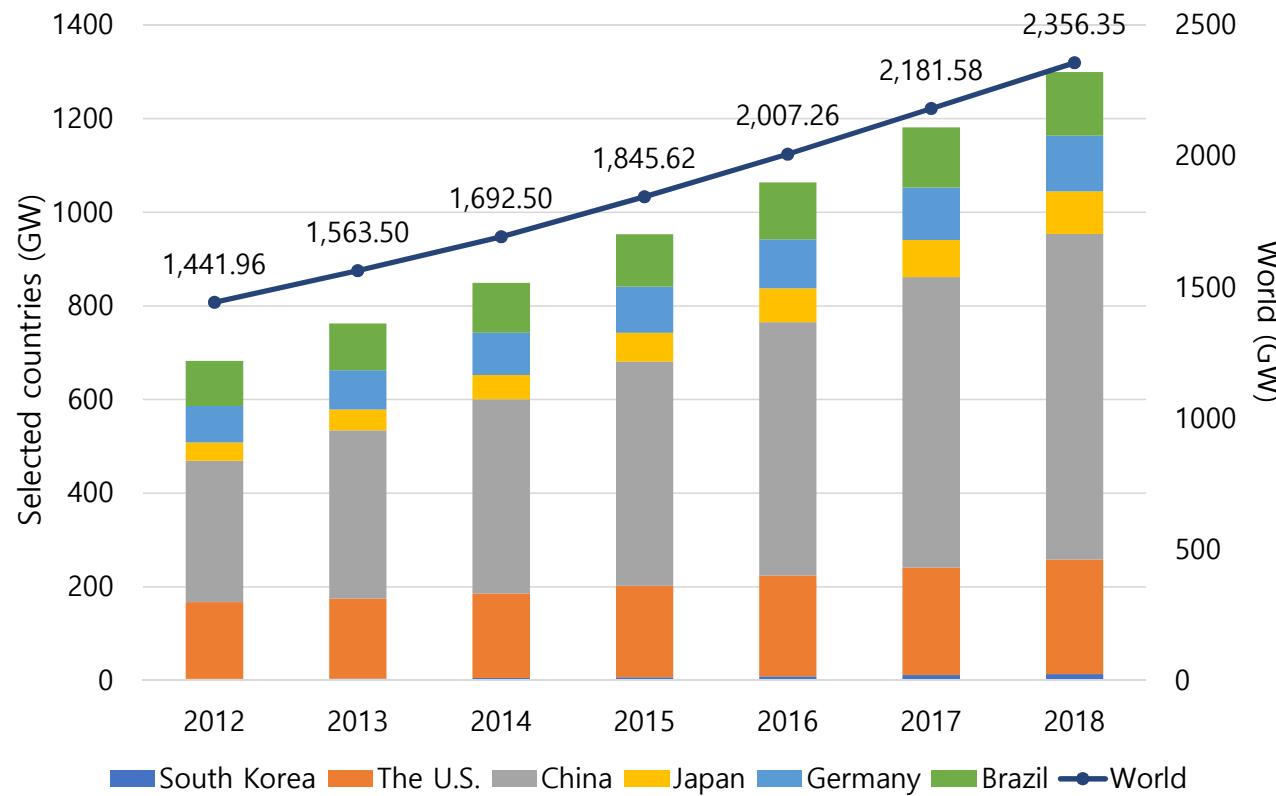


Figure. Renewable energy electricity capacity (IRENA, 2019a)

Renewable electricity  
capacity has been  
increasing worldwide  
up to 2,356 GW in 2018.

## I. Background

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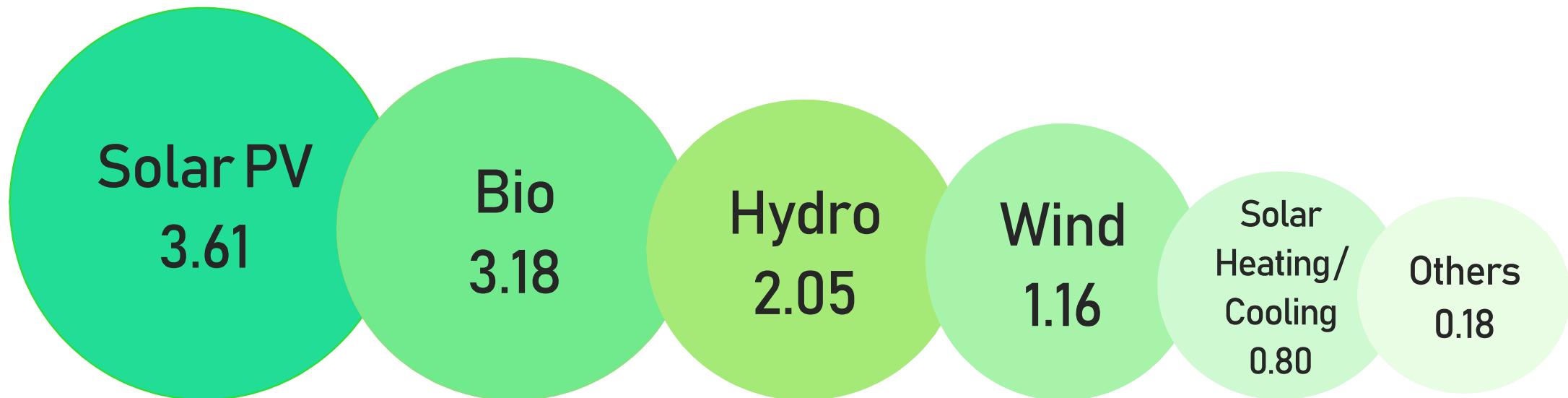


Figure. Renewable energy employment worldwide (2018) Unit: million

In 2018, **11 million** are employed in the renewable energy sector worldwide (IRENA, 2019)

# I. Background

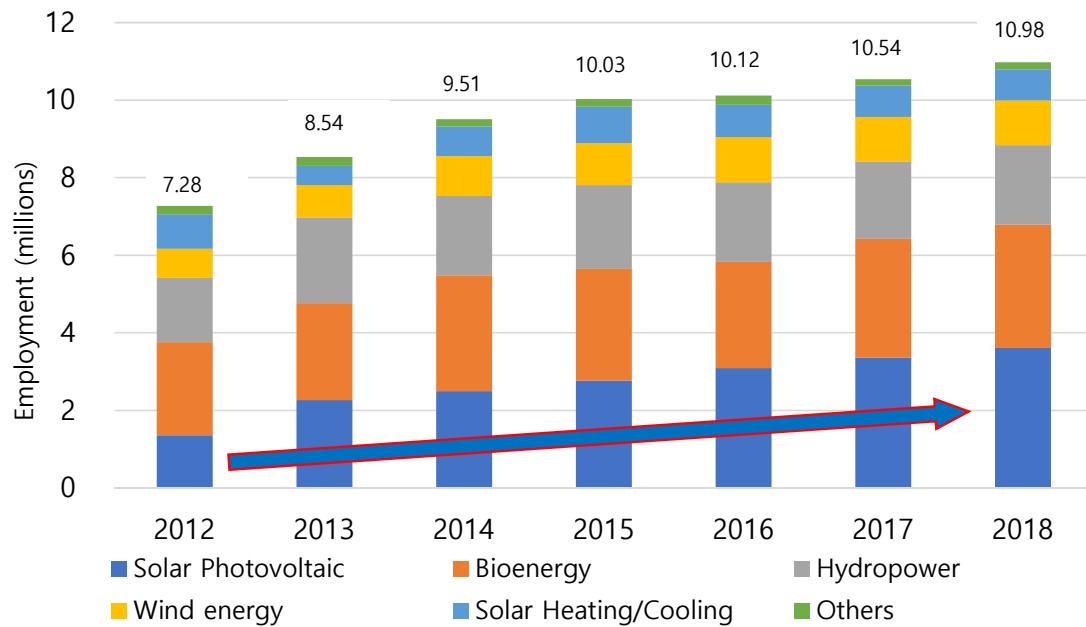


Figure. Renewable energy employment worldwide (IRENA, 2019)

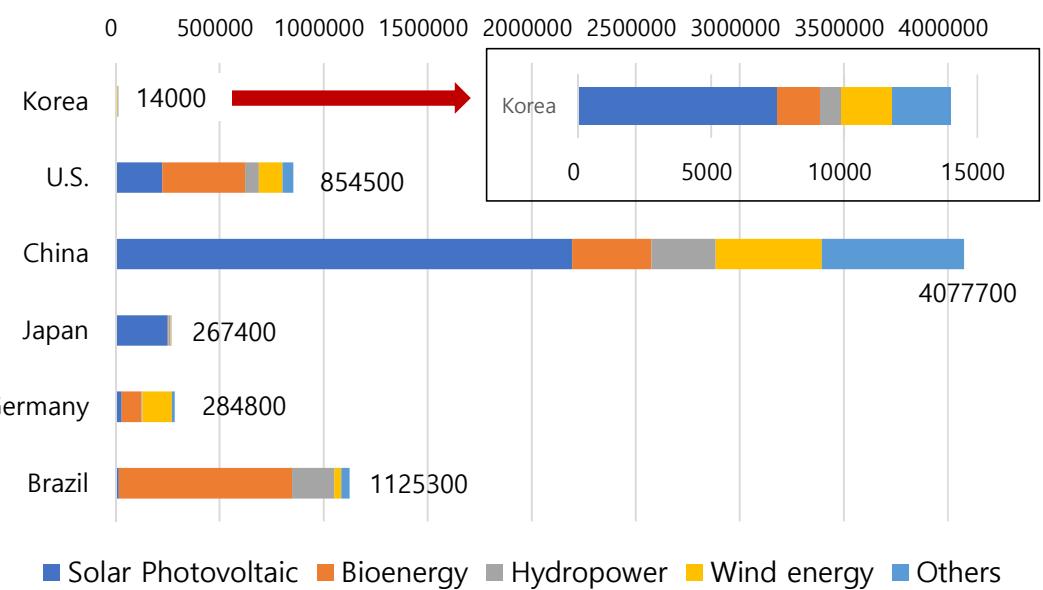


Figure. Renewable energy employment for selected countries (IRENA, 2019)

- Solar PV employment has been growing the fastest and takes up the largest proportion worldwide since 2016 (left fig.) and in South Korea, 2018 (right fig.).
- The increasing employment trend (left fig.) is a positive sign for Korea in pursuing a long-term expansion policy in the renewable energy sector.

# I. Background

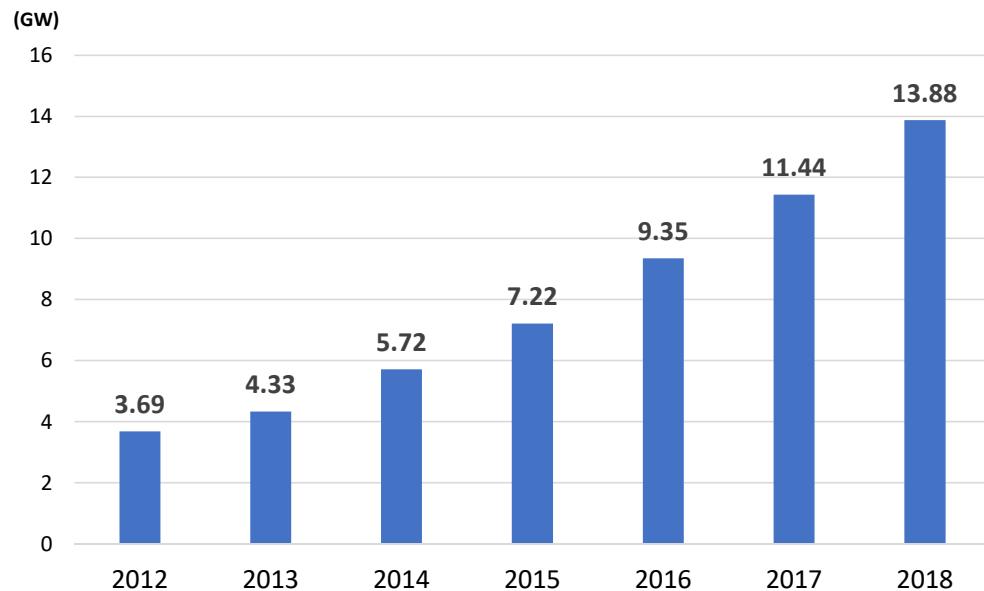


Figure. Renewable energy electricity capacity in Korea (GW)

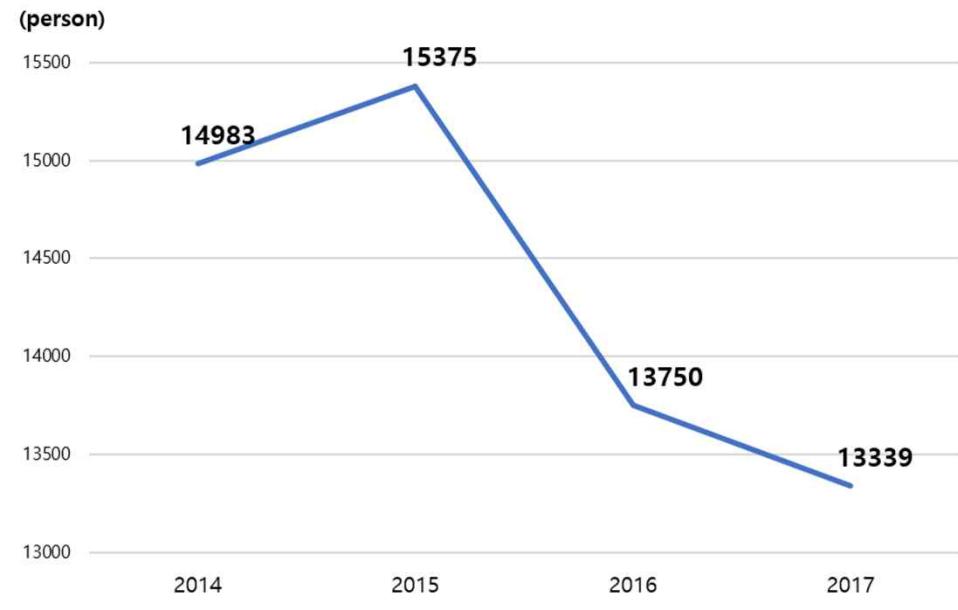


Figure. Renewable energy employment in Korea (person)  
(Korea Energy Agency, 2017)

Although Korea's renewable electricity capacity has been increasing, employment has been decreasing since 2015

# I. Background

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Table. Renewable energy employment and capacity (IRENA, 2019; ILO, 2019)

	Korea	World	Ratio (%)
RE power Capacity (MW)	13,880	2,356,350	0.59
RE Employment	13,339	10,980,000	0.12

# I. Background

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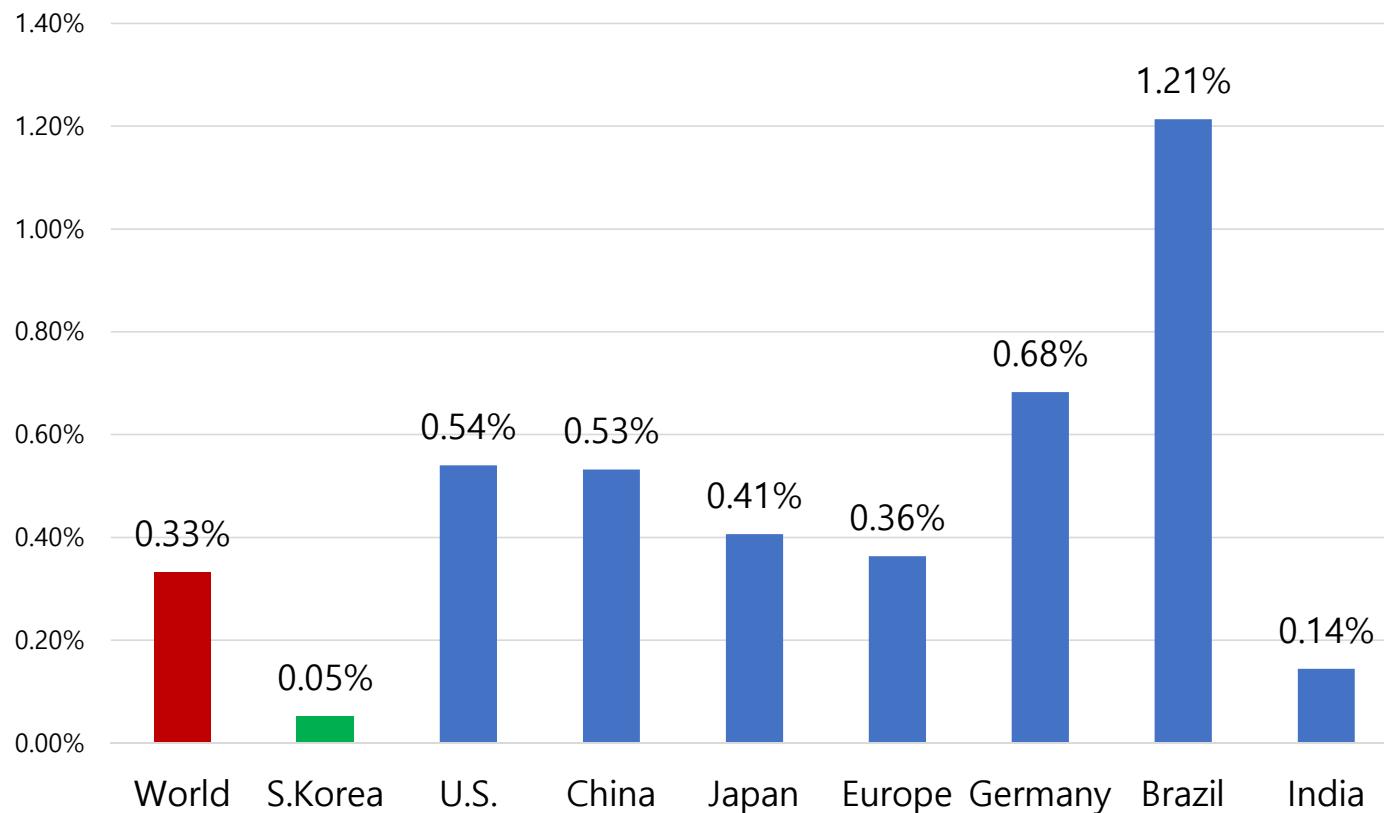


Figure. RE employment per national employment in total, 2018 (IRENA, 2019; ILO, 2019)

## I. Background

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**Korea needs to work on renewable energy expansion  
and decent jobs creation in the renewable energy sector**

The following issues need to be reviewed:

- Revise and improve national renewable energy employment statistics
- Investigate the effect of job creation in overseas countries
- Propose support system to domestic renewable energy companies for renewable energy expansion
- Estimate job creation under various long-term renewable energy expansion scenarios

## II. Issues in Renewable Jobs Statistics

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- Renewable energy employment classification
  1. **Value chain** : Series of activities carried out to produce products & services (IRENA, 2013)
  2. Economic effect
    - ▶ **Direct employment** : generated directly by core renewable energy activities
    - ▶ **Indirect employment** : employment that supply and support the core activities (steel, plastics or other materials production, financial and other services)
  3. Location & time frame : Import vs. Export, Long-term vs. Short-term
- Limitations of renewable energy employment statistics
  1. The range of value chains defined varies case by case
  2. The boundaries of direct and indirect jobs are not always clear. In particular, the definition of indirect jobs itself is ambiguous
  3. There are difficulties in standardizing data because it generates data using different methods, assumptions, and time frames for each source

## II. Issues in Renewable Jobs Statistics

- IRENA publishes annually "Renewable Energy and Jobs".
- The database includes direct employment and indirect employment when available. Hence some values are bound to be underestimated (e.g. USA vs. Korea).
- U.S. Renewable Energy Jobs consider both direct and indirect employment (EESI, 2019).
- Stats provided by Korea Energy Agency(KEA) neither consider indirect jobs nor properly reflect the jobs generated at various stages of value chain, estimating 13,339 persons in 2017.
- Korea Energy Economics Institute(KEEI, 2019) revised statistics classification and estimated 83,951 persons in 2017.

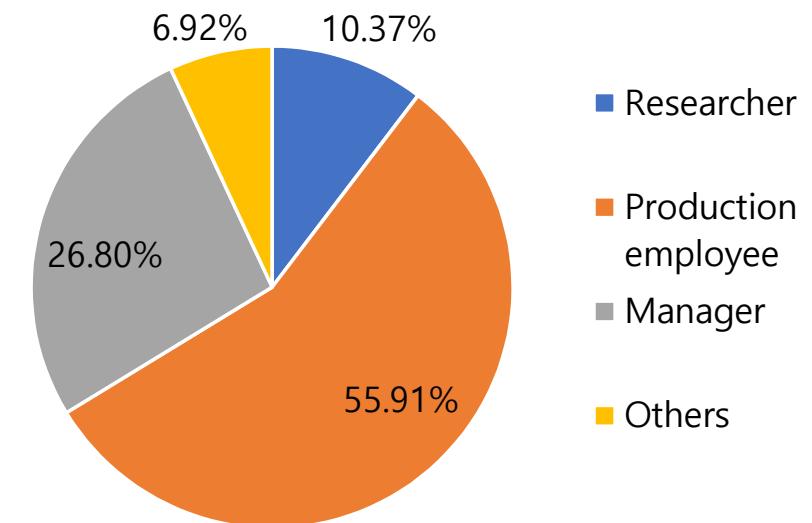


Figure. Renewable energy employment  
By Classification, 2017 (%)  
(Korea Energy Agency, 2017)

Future work in Korea  
should further expand value chain  
to include utilities and other  
services,  
and focus on indirect employment  
generated by renewable energy

### **III. Decent Jobs in Renewable Energy**

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- Job Quality (decent Jobs) is one of the most important issues around the world, and various indicators have been created.
  - The most frequently used indicators include job security, skill improvement, wages, working hours, industrial accidents and safety.
  - No existing studies have quantitatively evaluated job quality in the renewable energy sector.
- Various literature and overseas case studies suggest the need to
  - Create stable employment through expanding jobs in operation & maintenance and other services (recycling, etc.) that are long-term and stable
  - Localize high value-added areas so that the expansion of renewable energy leads to increased decent job creation (Korea Labor Research Institute, 2017)
  - Long-term investment is needed in basic research and professional training in high value-added fields of each renewable energy technology value chain

## **IV. Renewable Energy and Job creation**

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### Job creation under RE100 in private sector

- Expanding renewable energy is essential for climate and job creation policies
- The private sector RE100 campaign endorses 100% power consumption from renewable energy
- Such companies as Samsung Electronics, SK Hynix, LG Chem are continuously pressured by overseas clients to use renewable energy
- In Korea, it was only possible to procure RE through self-powering, but recently the Ministry of Commerce, Industry and Energy is trying to introduce green pricing and other policy measures
- In order to encourage Corporate RE100 in Korea, we need
  - To draft Direct Power Purchase Agreement(PPA) policy
  - To build an industrial park where direct and efficient renewable energy supply for the companies is possible

## IV. Renewable Energy and Job creation

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### Job creation under RE100 at the country level

- Job creation in the renewable energy sector was estimated using scenarios from WWF-Korea(2017) and Hong et al.(2019), which assume renewable energy expansion by 2050
  - Business-As-Usual (BAU) plus three alternative scenarios : Moderate Transition Scenario (MTS), Advanced Transition Scenario (ATS), Visionary Transition Scenario (VTS)
- Job creation estimates are centered on renewable technologies such as solar, wind, hydro and bio in the power generation sector
  - The employment factor(EF) of renewable energy (solar vehicles, solar heat, etc.) in non-power generation sector is excluded from the analysis because there is no existing literature to date
  - Renewable energy direct and indirect EFs are based on Wei et al.(2010) and Korea Labor Research Institute (2017)

## IV. Renewable Energy and Job creation

### Job creation under RE100 at the country level

- EFs are different depending on the renewable technology and its phase in the value chain. EFs also depend on regions or countries

TECHNOLOGY	MCI (Jobs per newly installed MW)	O&M (Jobs per MW)	REGION
	8.6	0.2	OECD countries (Average values)
Wind, onshore	27.0	0.72	South Africa
	6.0 <sup>a</sup>	0.50	South Africa
	12.1	0.1	United States
	8.8	0.4	Greece

Figure. Onshore wind power EF Estimation (IRENA, 2013)

MCI = Manufacturing, Construction, Installation

O&M = Operation and Maintenance

## IV. Renewable Energy and Job creation

Scenario	BAU	MTS	ATS	VTS
Base Policy	Policy based on 2016 Long-Term Energy Outlook by KEEI Nuclear energy replaces aged Coal-fired plant	Energy consumption per capita reduced Aged Nuclear power and Centralized power plants gradually reduced	Reflects more aggressive demand management than MTS Same assumption as MTS in supply side but with solar vehicles and solar power	The demand side same as ATS Assume 100% of the final energy demand is supplied with renewable energy
Final Energy Consumption	35.4% increase by 2050	7.0% reduction by 2050	24.0% reduction by 2050	24.0% reduction by 2050
Electrification	Increase from 31.9% in 2014 to 34.0% in 2050	Increase from 31.9% in 2014 to 45.8% in 2050	Increase from 31.9% in 2014 to 45.6% in 2050	Increase from 31.9% in 2014 to 74.9% in 2050
Renewable energy generation/total power generation	Increase from 2.1% in 2014 to 6.1% in 2050	Increase from 2.1% in 2014 to 67.7% in 2050 (5070 scenario)	Increased from 2.1% in 2014 to 60.4% in 2050 (5060 scenario)	From 2.1% in 2014 to 100% in 2050 (5000 scenario)

## IV. Renewable Energy and Job creation

### Job creation under RE100 at the country level

- Renewable energy job estimation by scenario

Scenario	2020	2025	2030	2035	2040	2045	2050
BAU	9,313	10,667	13,246	16,743	19,082	21,748	24,143
MTS	89,216	123,179	154,363	180,728	209,772	239,247	269,027
ATS	63,334	89,797	114,070	132,106	151,987	171,561	190,611
VTS	177,076	230,232	282,602	333,751	389,064	444,672	503,274

- Year 2050 Forecast
  - 24,000 jobs expected to be created in BAU scenarios
  - 269,000 jobs expected to be created in MTS scenario
  - In ATS and VTS scenarios, 190,000 jobs and 503,000 sustainable renewable energy jobs are created

## IV. Renewable Energy and Job creation

### Job creation under RE100 at the country level

- Employment estimate comparison in the renewable energy sector
  - KEA(2018) & KEEI(2019) under different statistical classification for 2017
    - ✓ KEA(2018) estimated 13,927 employees
    - ✓ KEEI(2019) estimated 83,951 employees
  - EFs in this research are applied to the renewable energy capacity (GWh) to estimate direct and indirect renewable energy jobs

Sum	Solar	Wind	Bio	Hydro
31,261	18,066	4,169	3,301	5,724

- 2.2 times larger than KEA(2018)'s but much smaller than KEEI(2019)'s
- KEA (2018) only considered direct employment in the manufacturing sector

## V. Conclusion

- Greater the power generation and higher the renewable energy proportion from the power generation, greater is the renewable energy job creation
- Considering the underestimated or omitted sectors in the analysis, more jobs are expected to be created
- Comparison with domestic automotive industry jobs

Table. Domestic car industry workers (Unit: persons)

Category	Manufacturing	Maintenance	Parts and interiors sales	Total
Employment	351,916	96,149	42,000	490,065

(Source: Statistics Korea, 2017; National Land Transport Statistics Nuri, 2017)

- In 2017, the total number of employment in the car industry was 490,000
- Under the VTS scenario, the total number of jobs in the renewable energy sector is expected to reach **500,000** in 2050, surpassing current employment size in the car industry