

# **Curtailment Issue of Renewable Electricity in Jeju Island**

**14 August 2020**

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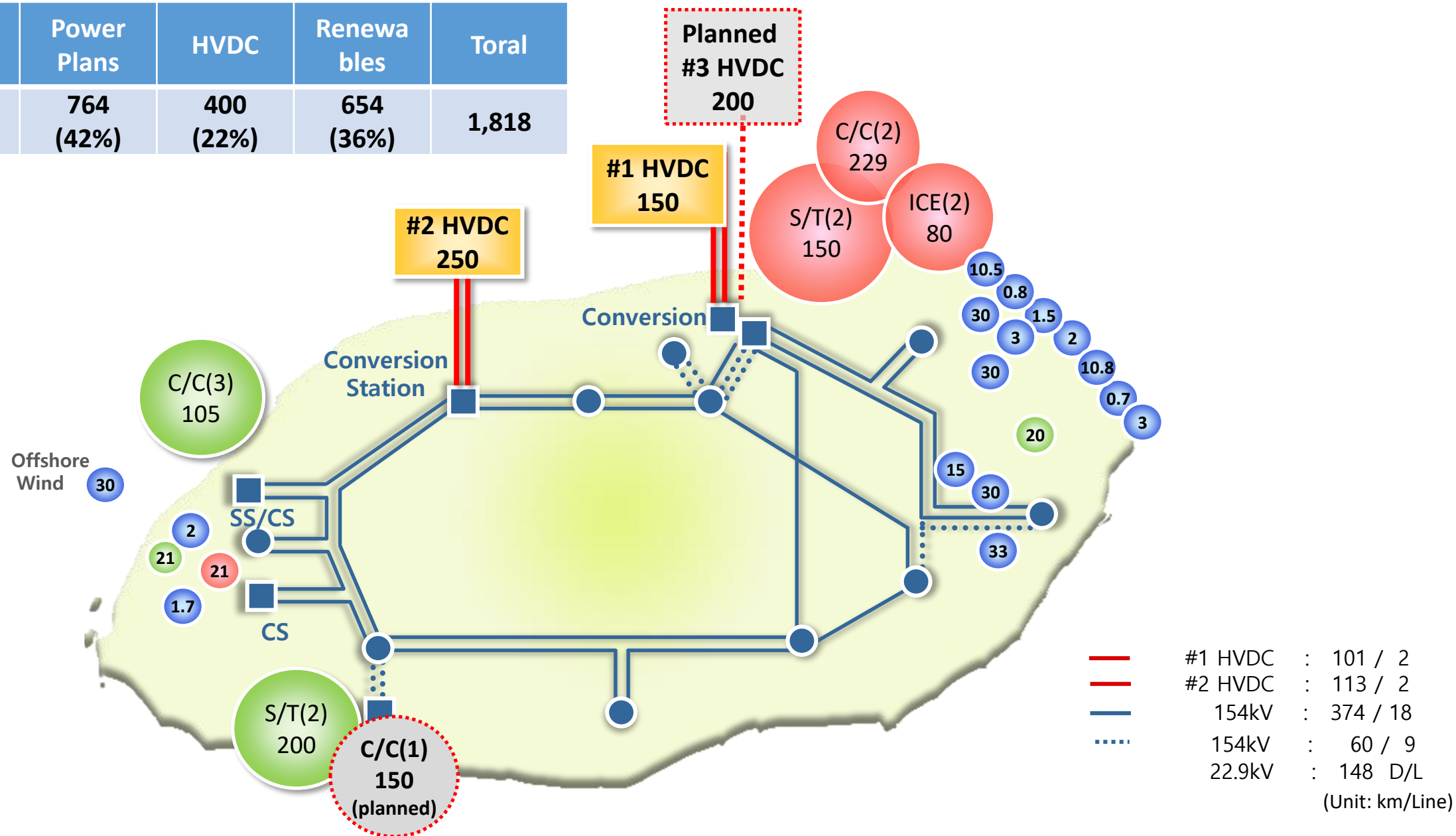
**Electricity Regulatory Commission**

**Republic of Korea**



# Electricity Installations

	Power Plans	HVDC	Renewables	Total
Capacity (MW)	764 (42%)	400 (22%)	654 (36%)	1,818



# Current situations

## ▶ Electricity systems in the Island

### ➤ Generation capacity: 1,818MW (in the end of 2019)

- ✓ Thermal plants 764MW(42%), HVDC from mainland 400MW(22%), renewables 653(36%) (wind 292MW)

### ➤ Generation(2019): 5,720 GWh

- ✓ Power plants 54%, HVDC 31.7%, renewables 14.3% (wind 9.6%)

### ➤ Load: Peak 965 MW, minimum 450 MW, average 653 MW

## ▶ Problem: Curtailment is increasing due to the expansion of intermittent small-sized PV

### ➤ About 90% of wind turbine is subject to be curtailed, mostly in daytime

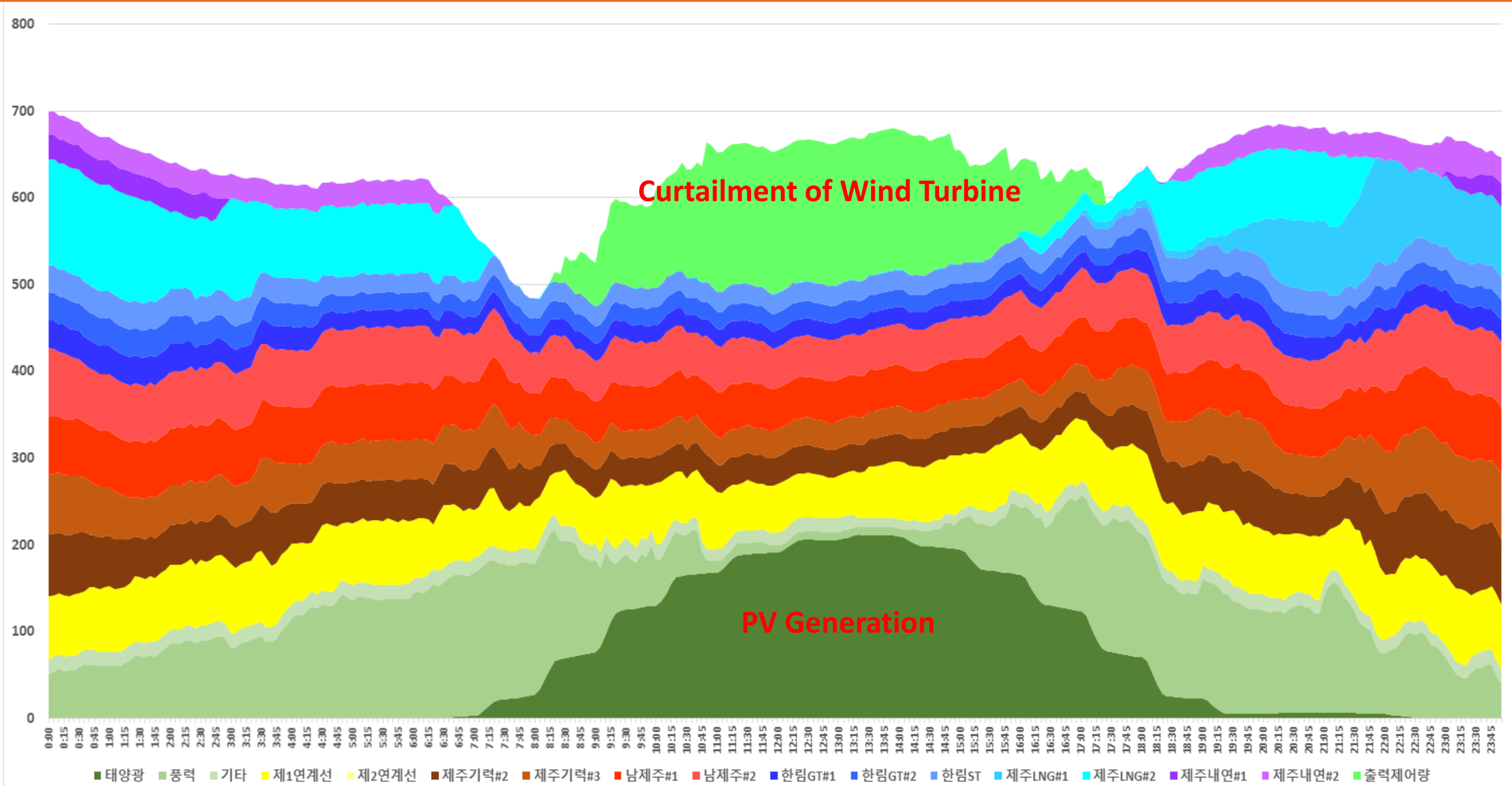
- ✓ No. of curtailment: 3(2015), 6(2016), 14(2017), 15(2018), 46(2019), 40(as the end of June 2020)
- ✓ Amount of curtailment(GWh): 0.05%(2016), 0.24%(2017), 0.25%(2018), 1.66%(2019), 4.44%(2020)

### ➤ In 2020, low electricity demand due to COVID-19(decrease compared to last year) aggravated the situation

## ▶ Issue

### ➤ How to minimize curtailment?

# Actual system operation (25 April 2020)



# Measures to minimize curtailment

## ▶ Operation of must-run generators and inflow from HVDC at minimum possible

- Most of ST and CC generators are to be operated at minimum level in case of curtailment
  - ✓ 4 ST: 350 MW → 154 MW, 2 CC: 229MW → 140 MW, the others: Stop
- Inflow from HVDC to be operated at minimum: Capacity: 400 MW → Minimum operation: 100MW

## ▶ Revision of the market operation rules and the codes for T&D line connection

- Control of generation and provision of real time information for renewable electricity more than 100 kW

## ▶ Other measures

- **Utilization of ESS:** Until next year, 90 MW of ESS for power reliability will be installed
- **Use of DR:** For example, merit for the charge of electric vehicle when curtailment
- **More HVDC:** 2-way flow for #2 HVDC, installation of #3 HVDC(all time 2-way flow) in 2023
- **Introduction of new technologies in the long run:** V2G, P2G, VPP, etc

## ▶ Electricity (wholesale) market reform is under study

- **Now:** Day ahead market → Studying the introduction of daily market and real time market