

# Open Data and Civic Hacking for Energy Transition

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SCIENCE AND  
TECHNOLOGY POLICY  
INSTITUTE

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## **1. Introduction**

## **2. Case Study 1: Open Data and Renewable Map**

## **3. Case Study 2: Civic Hacking and Rooftop Solar Identification**

# 1

# Introduction

# 1 Introduction: History

2024.06 **Top 100 Climate Tech in the Indo-Pacific by IPEF**

2023.09 Investment from **Hyundai Motors Group**

2023.03 Minister of Environment Award

2023.01 **CES 2023 Innovation Award**

2022.11 Selected startup by Samsung Electronics (C-Lab)

2021.11 **President's Award**

2021.10 **Prime Minister's Award**

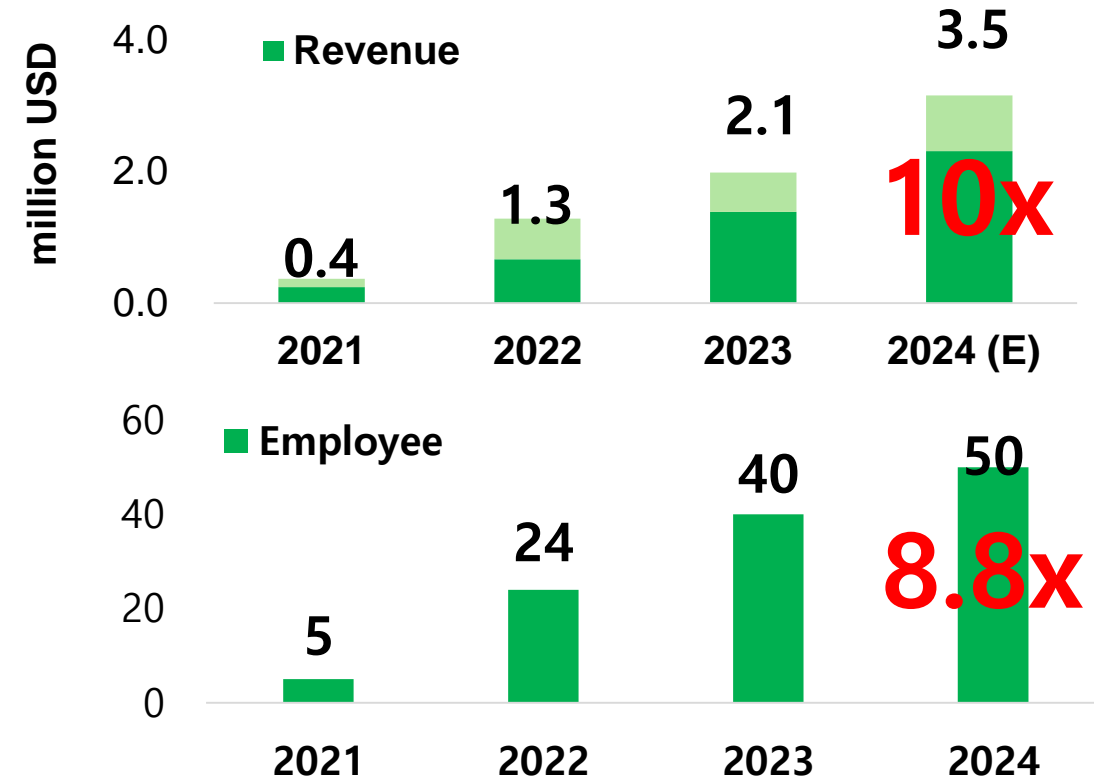
2021.08 Minister of Trade, Industry and Energy Award

2021.07 Minister of SMEs and Startups Award



**Samsung C-Lab**

**SKT | ESG Korea 2021**

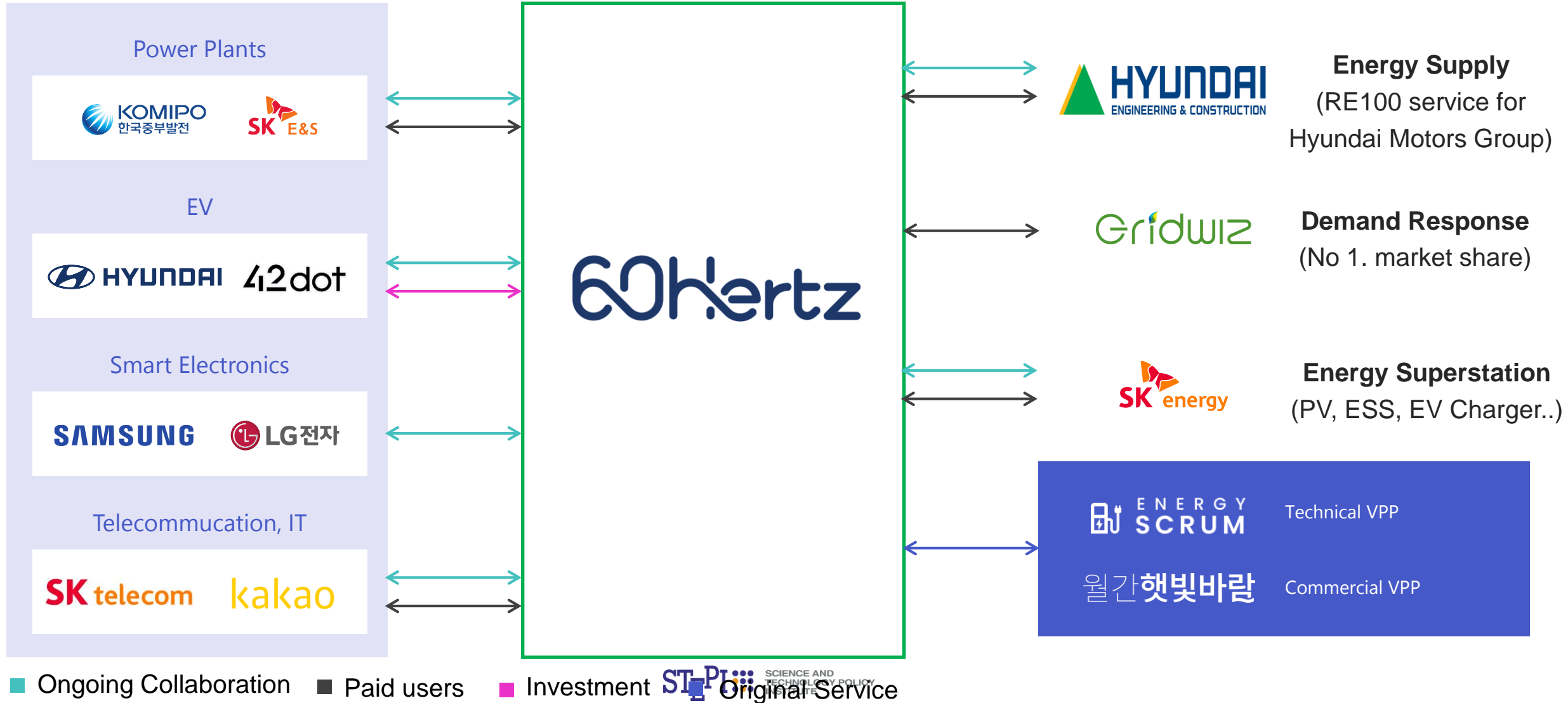


# 1 Introduction: Business

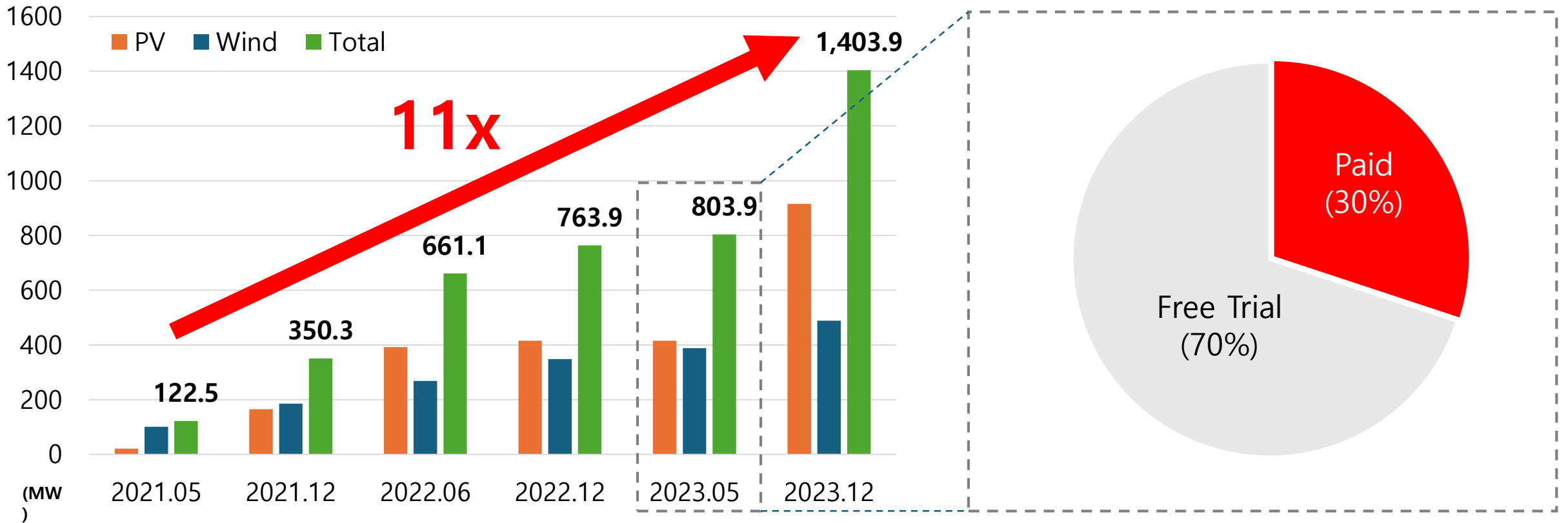
## Distributed Energy Resources (DERs)

## SW and Service Provider

## Various business models using DERs



# 1 Introduction: Business



\* **30%** conversion rate

\* **SK Innovation E&S\*\***, **Korea Midland Power (KOMIPO)\*\*\***, **Hyundai Motors Group**, **Korea Energy Agency**, **Korea Power Exchange** are our customers

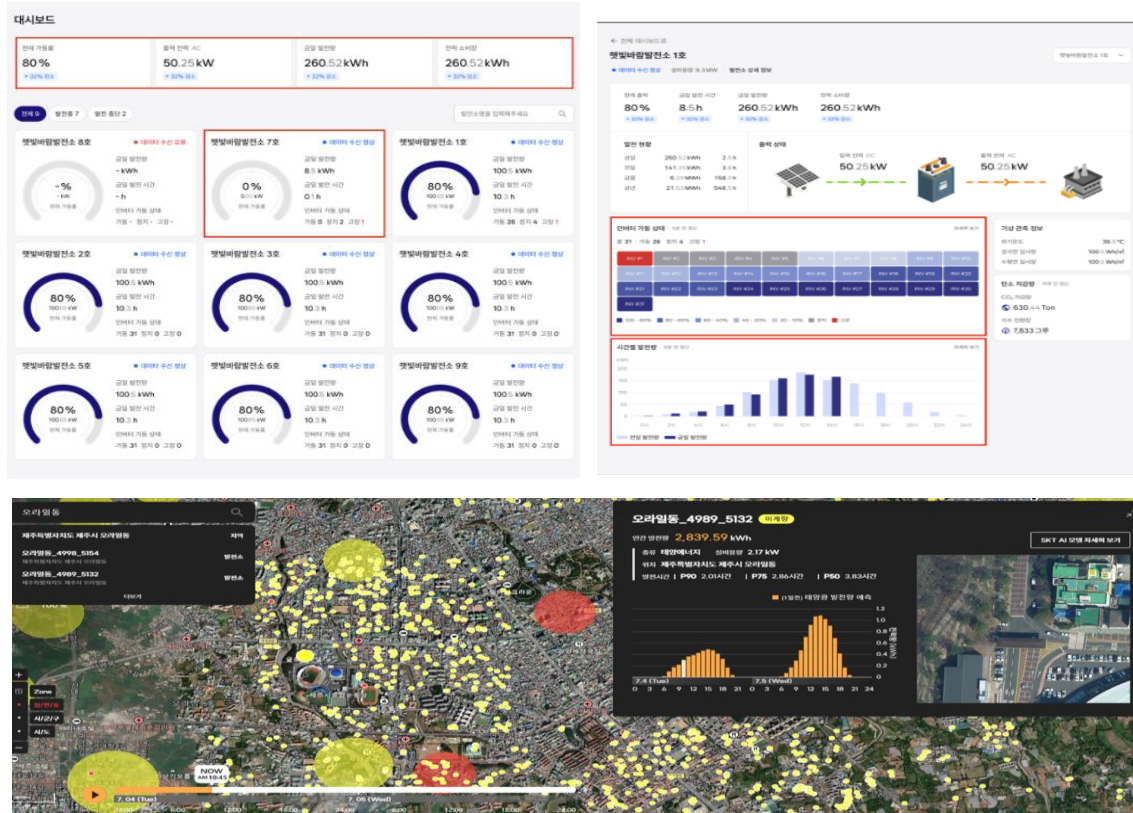
\* Approximately 8 % of renewable projects in S. Korea (2021)

\*\* Revenue: **9.4 billion USD / year** (No 1. private energy company)

\*\*\* Revenue: **4.5 billion USD / year** (One of the top 6 government energy companies)

# 1 Introduction: R&D

## Nationwide Renewable Monitoring System



> 100,000 PV, Wind, Geothermal Projects  
(with Korea Energy Agency)

## V2G Consortium R&D (\$30M)

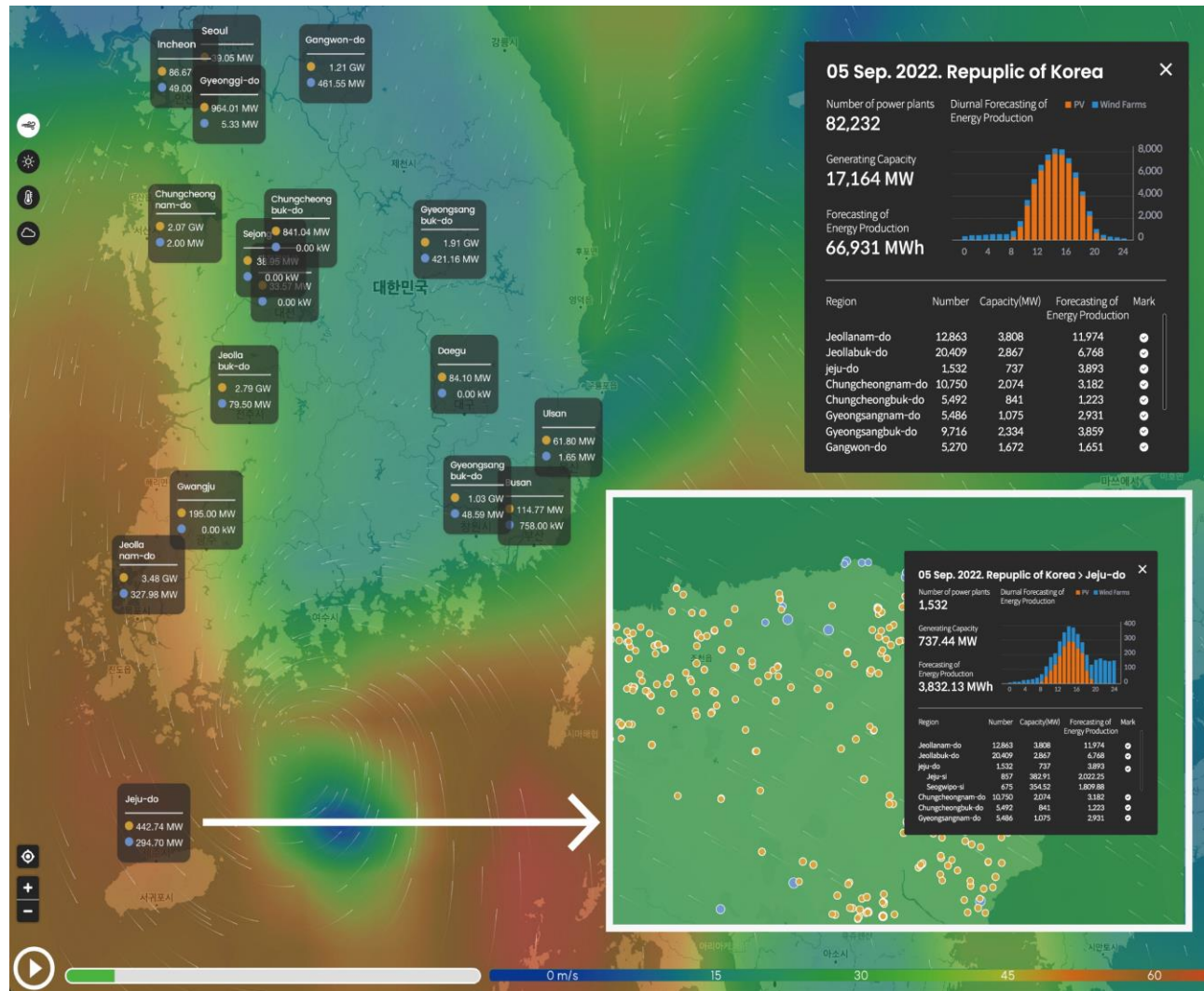


> 10,000 EVs, >1,000 Chargers  
(with Hyundai Motors Group)

## Case Study **1**

# Open Data and Renewable Map

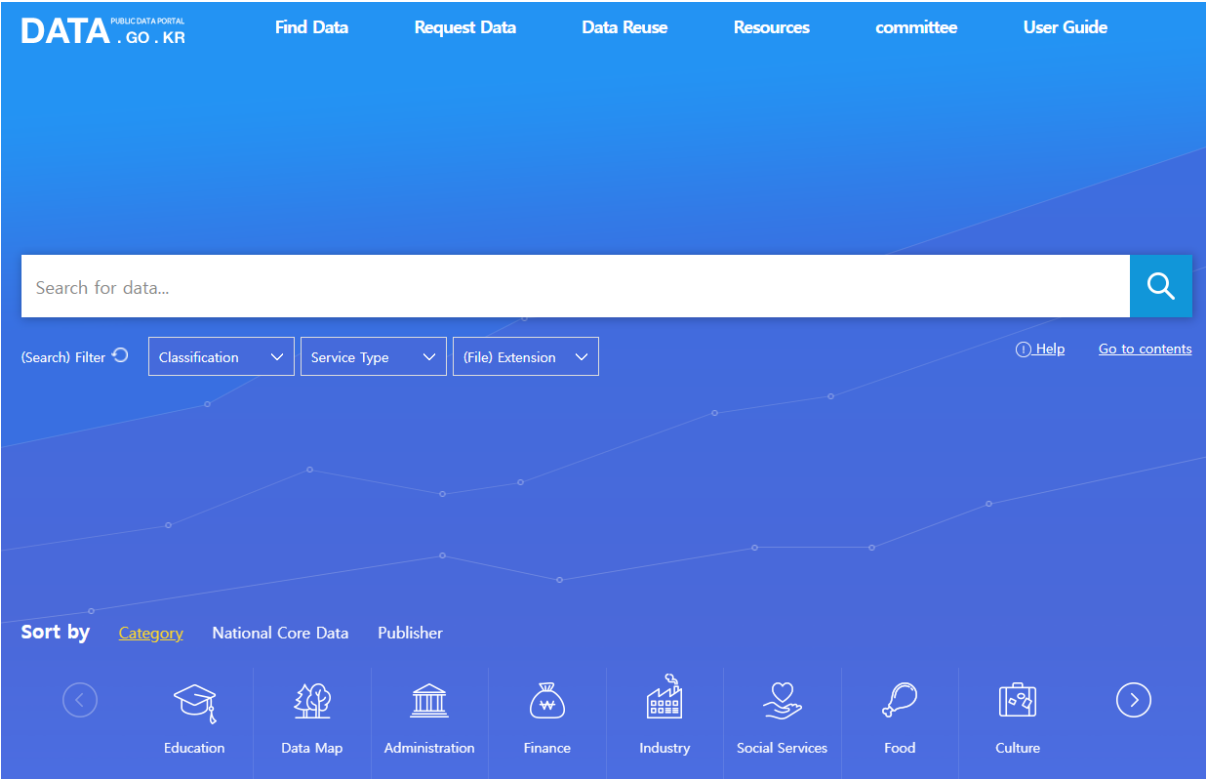
# Case Study 1 Korean Renewable Map (2021)



Case Study

1

Open Data Portal



OPENAPI Detail

[copy URL](#)

**XML** **JSON** Korea Power Exchange\_Hourly solar power generation information by region

This is a service that shows the amount of solar power generation by region and hourly. Provides date, region, transaction time, and power generation by city/province. Unit: MWh

About OpenAPI

[Download metadata](#)

Classified	Industry-Trade-Small and Medium Business - Energy and resource development	Provided By	
Department		Department No	061-330-8713
API Type	REST	Data Format	JSON+XML
Usage	237	Keyword	hourly,by region,sunlight
Registered	2022-08-04	Edited	2022-08-08
Deliberation Type	dev : allow / run : disallow		
Payment	free		
Scope of License	<a href="#">The use permission range limitless</a>		
References			

# Case Study 1 Weather Forecasting Data



KOR

## KMA Weather Data Service Open MET Data Portal

About Open MET Data Portal

National Climate Data Center Introduction

Easy to Access + Easy to Use + Easy to Understand

## Weather Data Service

Weather!  
Become a data.

Easy to Access  
Easy to Use  
Easy to Understand

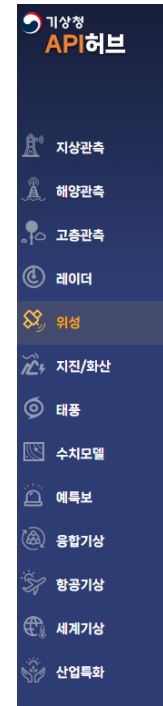
Open Weather Data Portal

CSV  
XML

Agriculture

Fishery

Manufacture



요 소	우리나라의 기상관측, 수치예보, 기후감시, 우주기상감시의 역량을 강화했습니다. (기본관측)가시영상(4개), 단파적외영상(1개), 근적외영상(2개), 수증기영상(3개), 적외영상(6개) (기상산출물)가강수량, 강우강도, 구름수역경로, 구름인자유효반경, 구름층/고도, 구름탐지, 대기불안정도 지수, 대기운동벡터, 산불탐지, 상향장파복사(대기상향), 안개, 에어로졸 광학두께 에어로졸 입자크기, 연직온도 프로파일, 연직습도 프로파일, 운량, 운상, 운형, 적설/해빙, 지표면온도, 청천복사량, 총오존량, 하향단파복사(표면도발일사량), 해수면온도, 해수면온도 등 총 !
지 점	전구, 동아시아, 한반도
보유기간	2019년 7월 ~ 현재
생산주기	- 전구/동아시아: 매시 - 한반도: 매시 정각부터

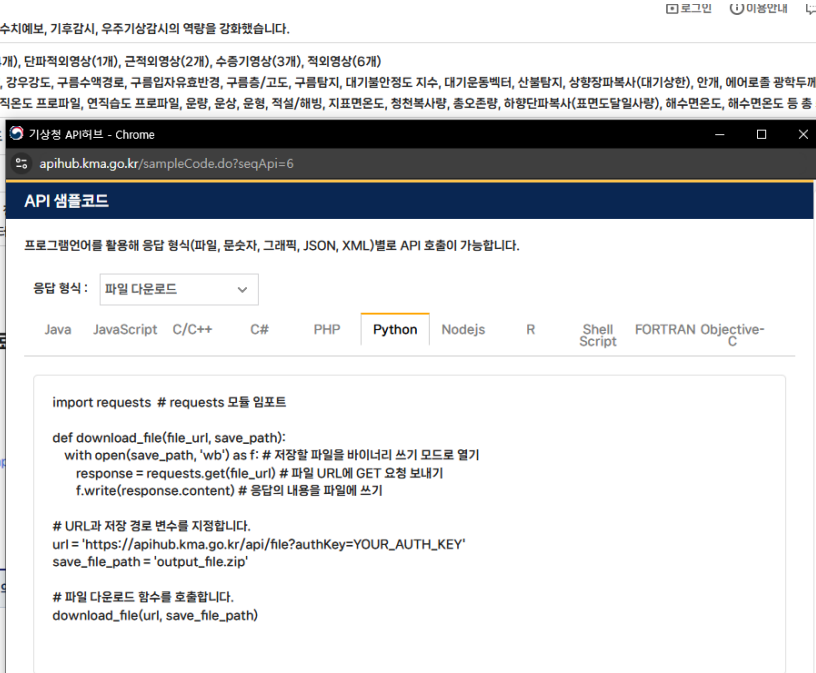
### 1. 천리안 2A호 기본관측자료

#### 호출URL정보

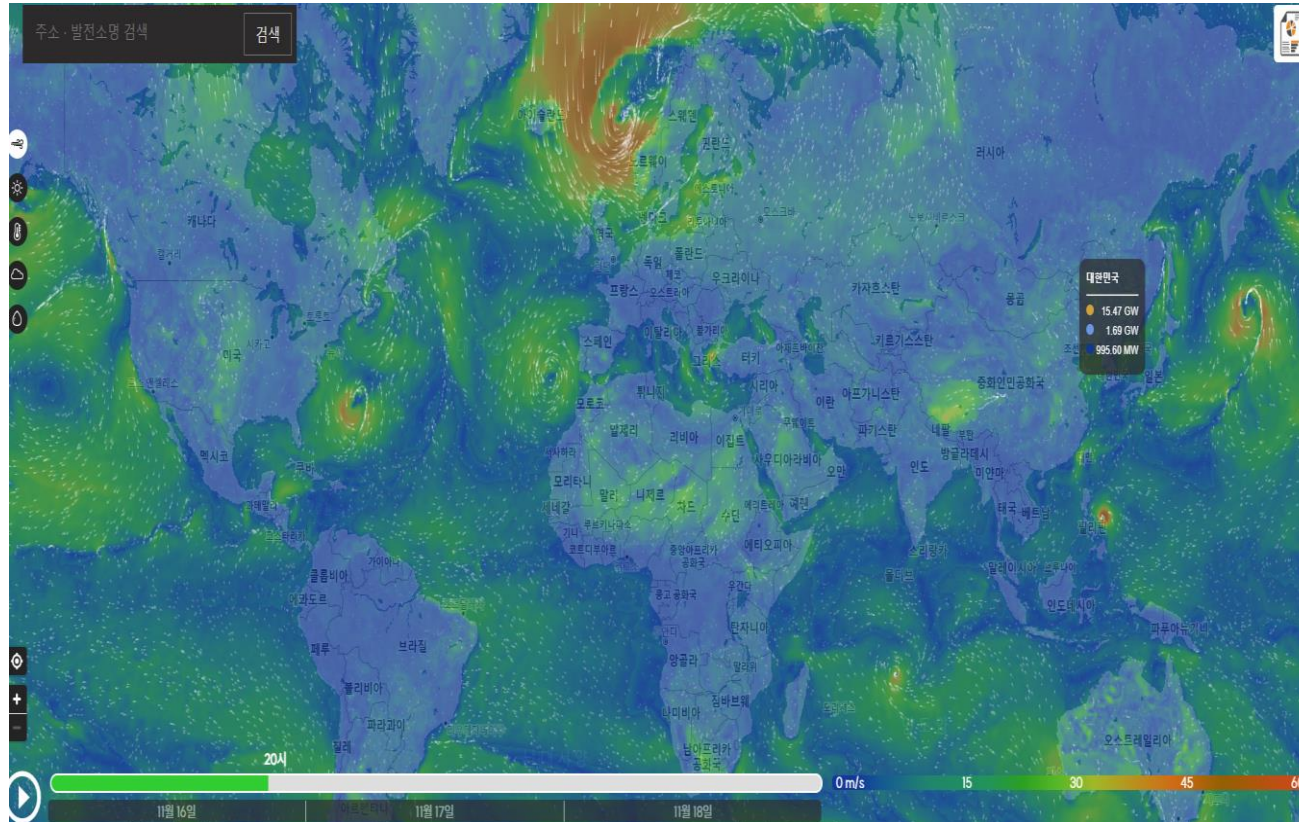
<https://apihub.kma.go.kr/api/typ05/api>

#### 요청인자

인자명	의미
URL	Path 의미
자료종류	요청 자료 종류



# Case Study 1 Future Plan



## PV Power REC, PVA Energy Solutions and 60Hertz join forces on IT-driven renewable energy solutions

November 08, 2024 - 12:02

Like 1 Share

f X YouTube Instagram Email

0:00 / 0:00

With this memorandum of understanding, the parties pledge to combine their expertise to advance a range of renewable energy projects.

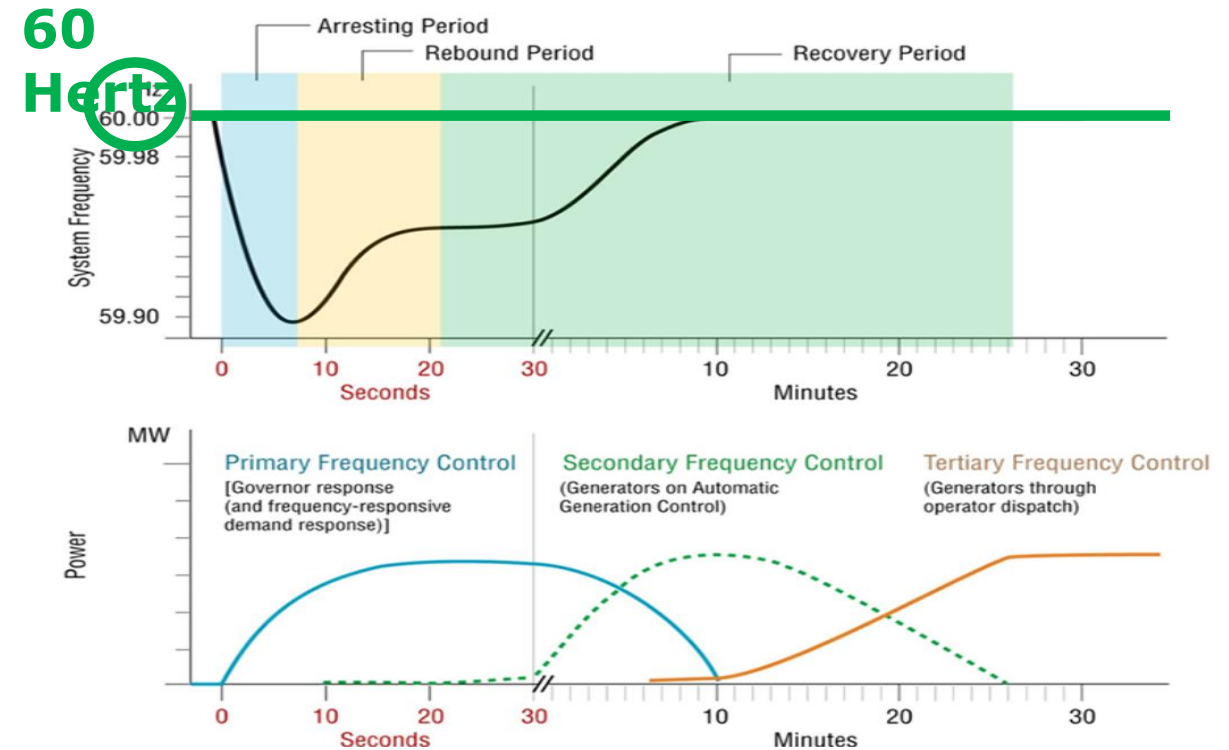
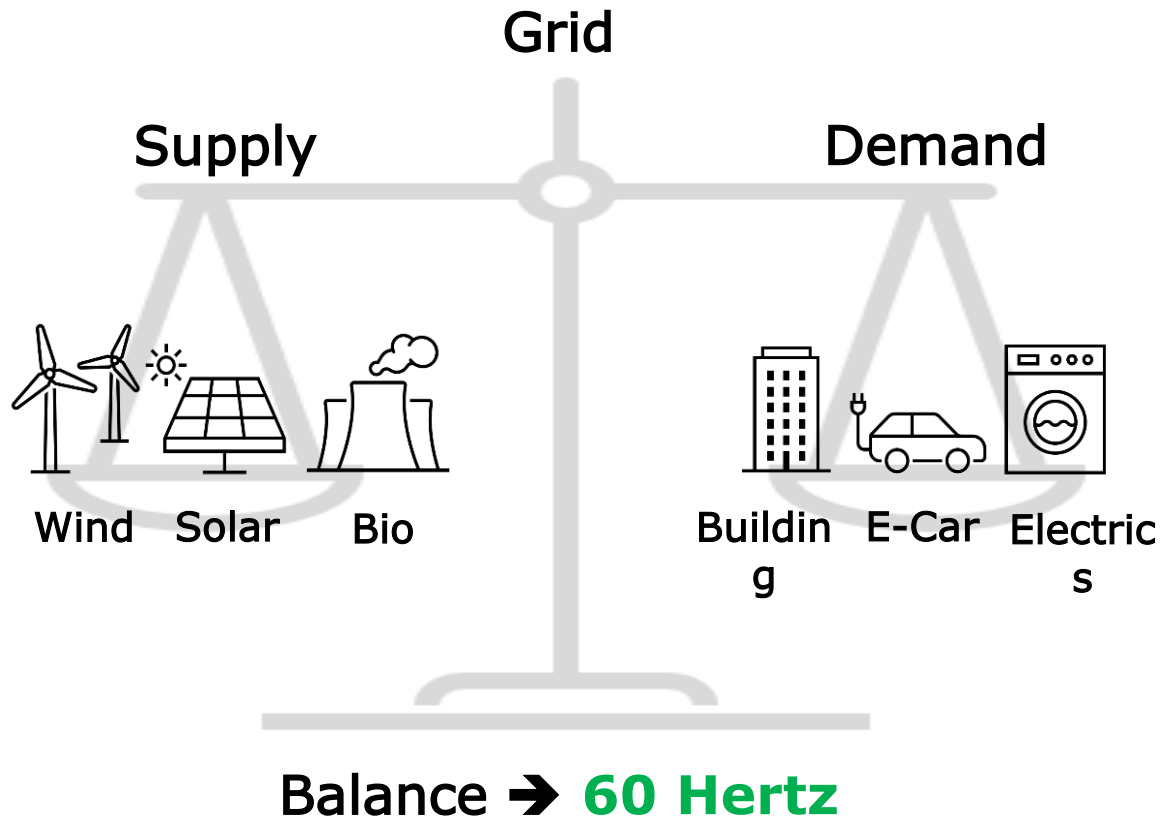


Representatives of three parties at the signing ceremony on November 4. — Photo courtesy of the organiser

## Case Study 2

# Civic Hacking and Rooftop Solar

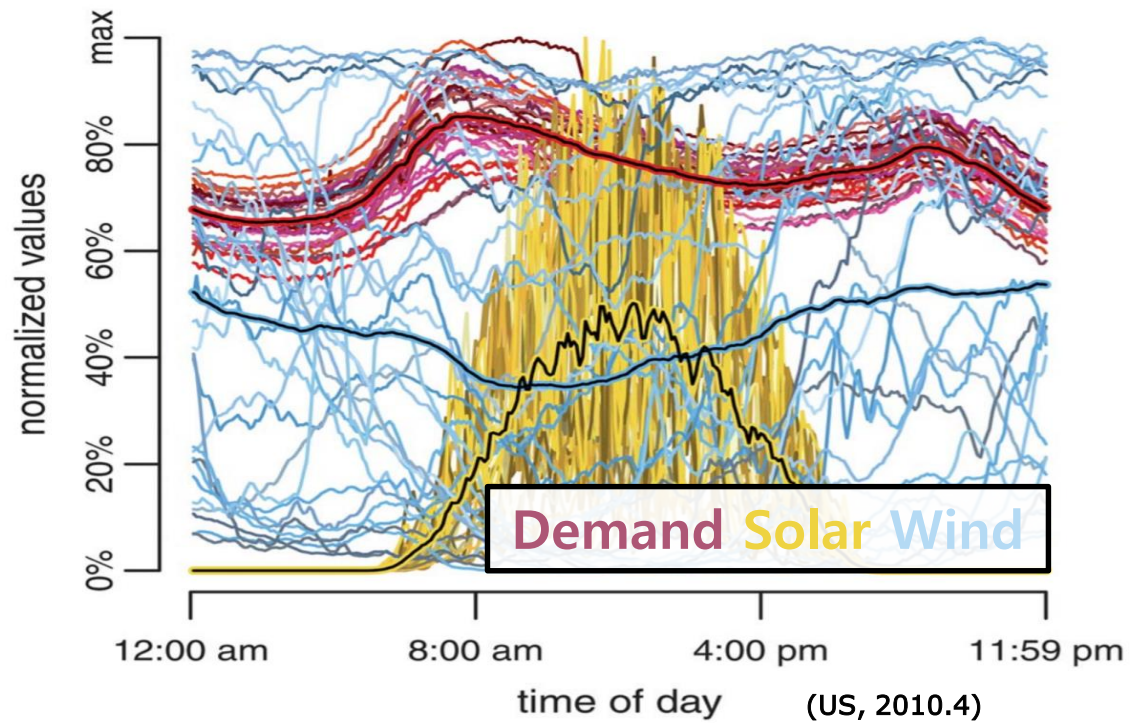
# Case Study 2 Stability of Electricity Grid



Joe Eto, Lawrence Berkeley National Lab

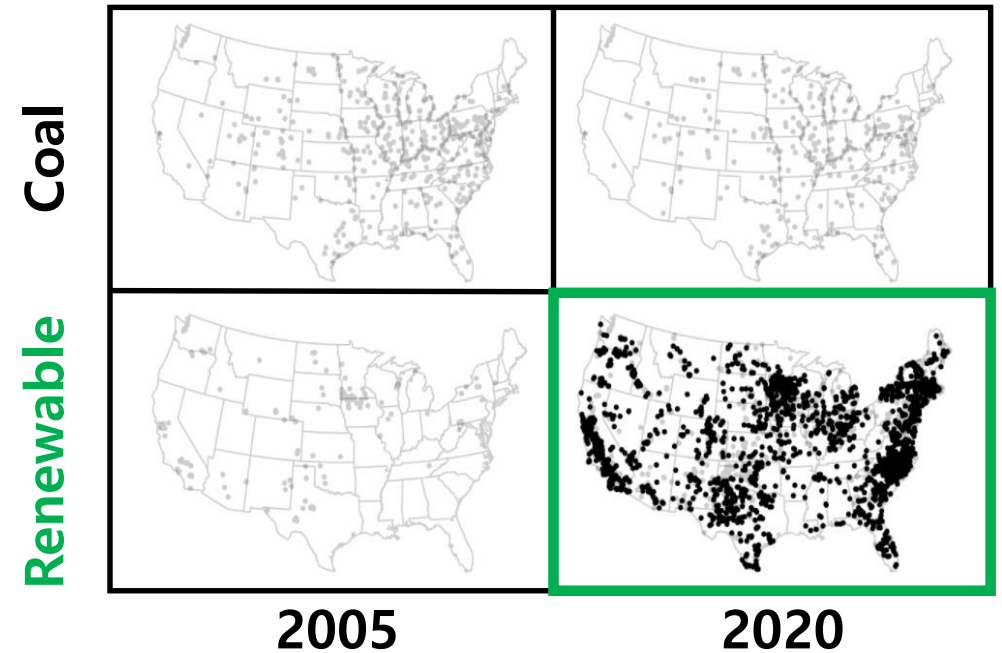
# Case Study 2 Renewable Energy

## Intermittency



Barnhart et al., Energy & Environmental Science, 2013

## Small and Distributed



Doan et al., *What's the World's Biggest Climate Victory?*, Bloomberg, 2019

## Case Study 2 Rooftop Solar Problem



# Case Study 2 The Idea: Aerial Image x AI Computer Vision

## scientific data

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[nature](#) > [scientific data](#) > [data descriptors](#) > article

Data Descriptor | [Open access](#) | [Published: 20 September 2023](#)

### A solar panel dataset of very high resolution satellite imagery to support the Sustainable Development Goals

[Cecilia N. Clark](#)  & [Fabio Pacifici](#)

[Scientific Data](#) **10**, Article number: 636 (2023) | [Cite this article](#)

**4341** Accesses | **1** Citations | **20** Altmetric | [Metrics](#)

#### Abstract

Effectively supporting the United Nations' Sustainable Development Goals requires reliable, substantial, and timely data. For solar panel installation monitoring, where accurate reporting is crucial in tracking green energy production and sustainable energy access, official and regulated documentation remains inconsistent. Reports of solar panel installations have been supplemented with object detection models developed and used on openly available aerial imagery, a type of imagery collected by aircraft or drones and limited by cost, extent, and geographic location. We address these limitations by providing a solar panel dataset derived


## scientific data

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[nature](#) > [scientific data](#) > [data descriptors](#) > article

Data Descriptor | [Open access](#) | [Published: 28 January 2023](#)

### A crowdsourced dataset of aerial images with annotated solar photovoltaic arrays and installation metadata

[Gabriel Kasmi](#) , [Yves-Marie Saint-Drenan](#), [David Trebosc](#), [Raphaël Jolivet](#), [Jonathan Leloux](#), [Babacar Sarr](#) & [Laurent Dubus](#)

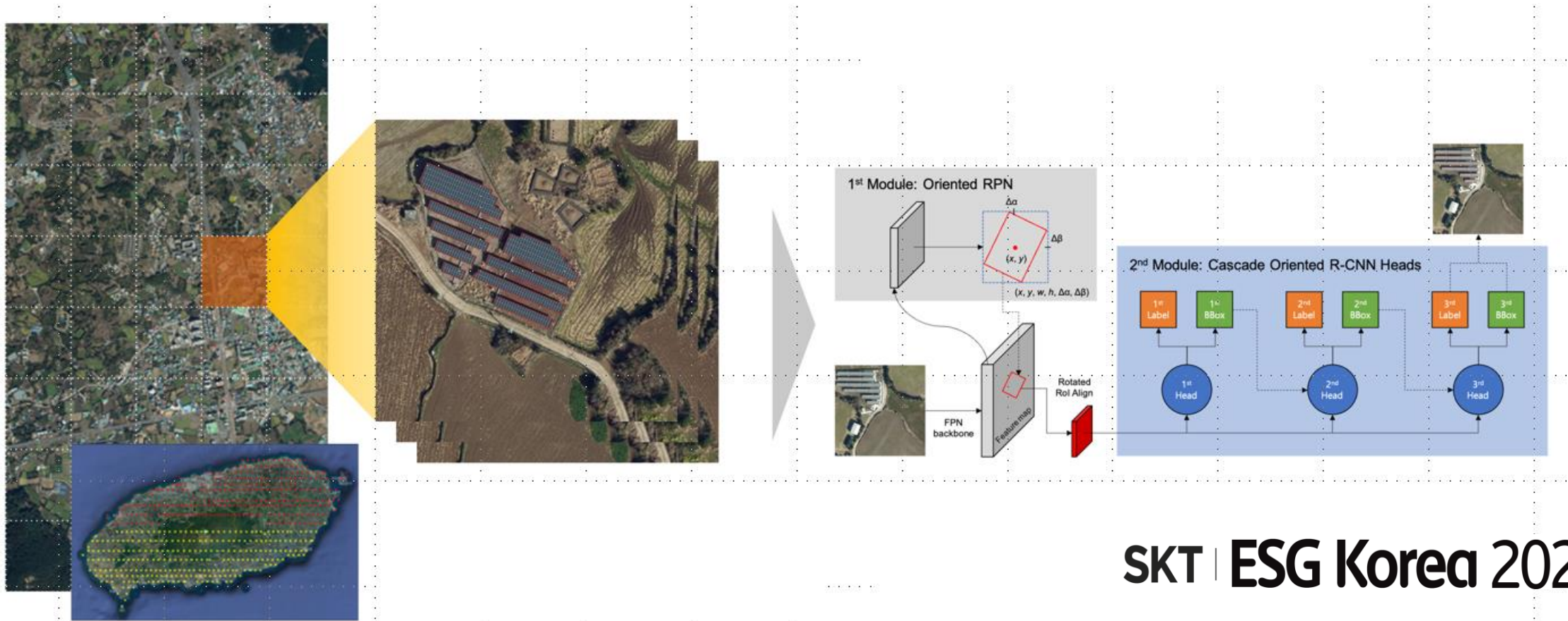
[Scientific Data](#) **10**, Article number: 59 (2023) | [Cite this article](#)

**5174** Accesses | **10** Citations | **26** Altmetric | [Metrics](#)

#### Abstract

Photovoltaic (PV) energy generation plays a crucial role in the energy transition. Small-scale, rooftop PV installations are deployed at an unprecedented pace, and their safe integration into the grid requires up-to-date, high-quality information. Overhead imagery is increasingly being used to improve the knowledge of rooftop PV installations with machine learning models capable of automatically mapping these installations. However, these models cannot be reliably transferred from one region or imagery source to another without incurring a

# Case Study 2 Initial Research: Jeju Island



SKT | ESG Korea 2021

Working with AI engineers at SKT



# Case Study 2 Initial Research: Jeju Island



# Case Study 2 Future Plan

Online Volunteers  
( > 10 engineers)



## LAB소개

[Tech for Impact LAB을 신청하기 전]  
본 LAB은 카카오임팩트와 모두의연구소가 공동으로 운영하는 Tech for Impact LAB에 참여를 원하는 분들을 위한 프로그램입니다. 2024년 10월에 시작되어 약 5개월 동안 진행되며, 실제 서비스 개발 과정에 함께하고 끝까지 책임감을 가지고 참여하실 분들을 모집합니다.

kakao!impact

### [테크포임팩트] 태양광 찾아볼 Lab

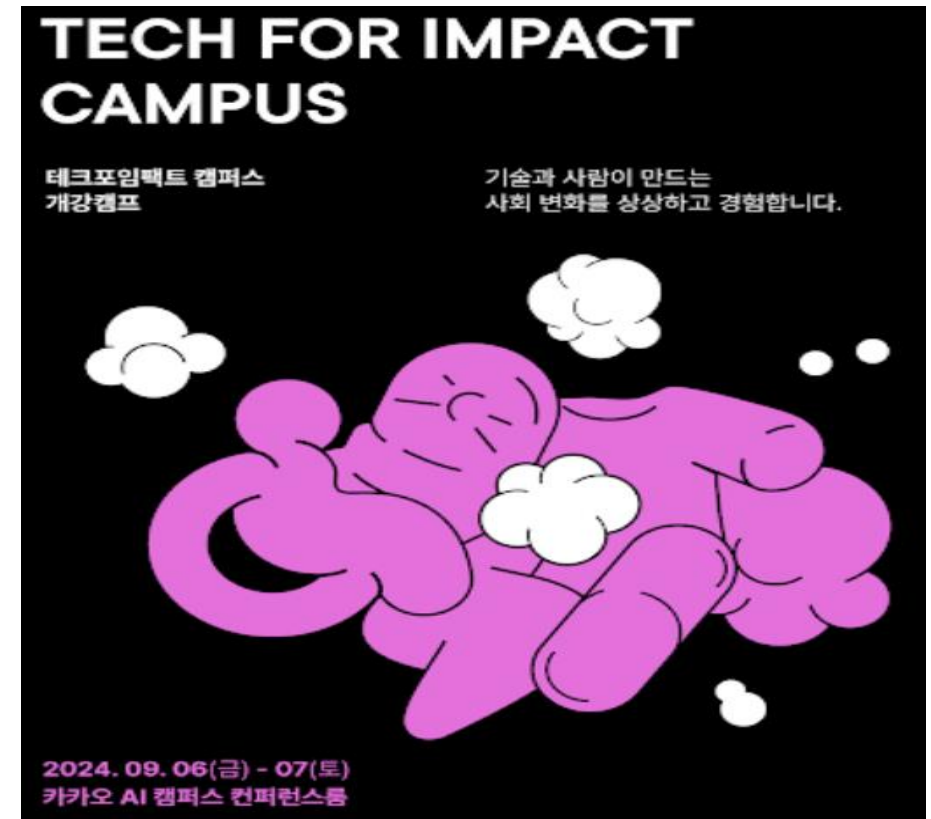
모임시작	2024년 10월 07일
모임일시	격주 월요일 19:30 ~ 21:30
모임장소	강남
모집기간	2024년 09월 10일 ~ 10월 03일
모집인원	15명
모집방법	선발
모임비용	무료

활동중

모집 알림 받기



University Program  
( > 5 students)



Thank  
You.