

# ITRI

Industrial Technology  
Research Institute

## CCS Status in Taiwan

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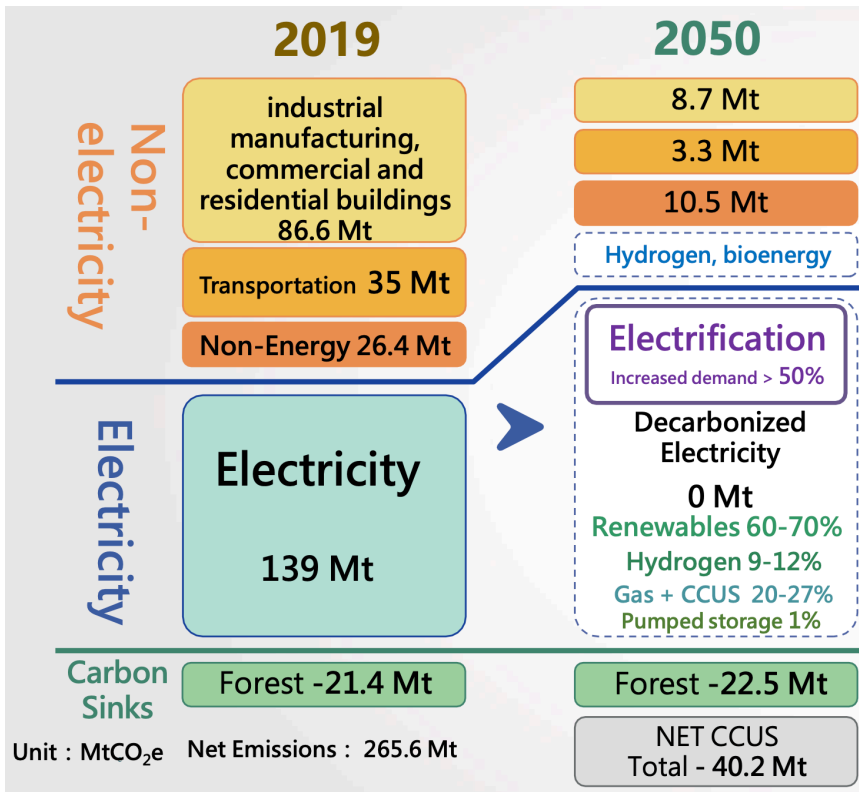
6<sup>th</sup> International Workshop on Offshore Geologic CO<sub>2</sub> Storage, Aberdeen, UK

13 - 15 September 2023



# Taiwan EPA's Climate Change Response Act

## Taiwan's 2050 Net-Zero Emissions Plan (2022)



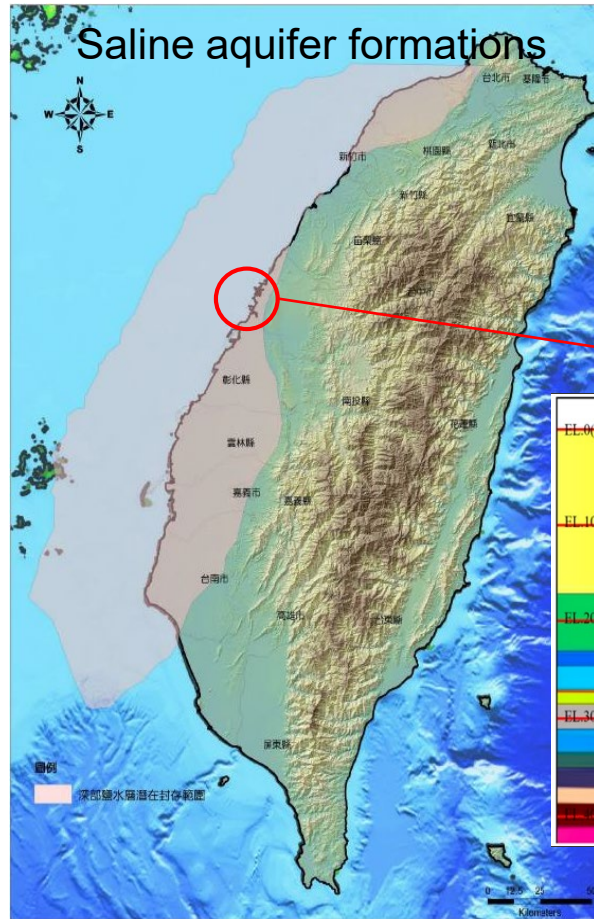
To response to the 2050 net-zero emission plan, the *Greenhouse Gas Reduction and Management Act* (GHG Management Act), prepared by the Environmental Protection Administration (EPA), passed the third reading at the Legislative Yuan on January 10, 2023 and was revised as the ***Climate Change Response Act***.

- "2050 net-zero" is now law, establishing authority and responsibility among agencies
- Incorporating just transition, leaving no one behind
- Introducing carbon fee and planning diversified incentives
- Inclusion of climate adaptation, building a resilient Taiwan
- **Inclusion of CCS in the article 39 and article 40.**

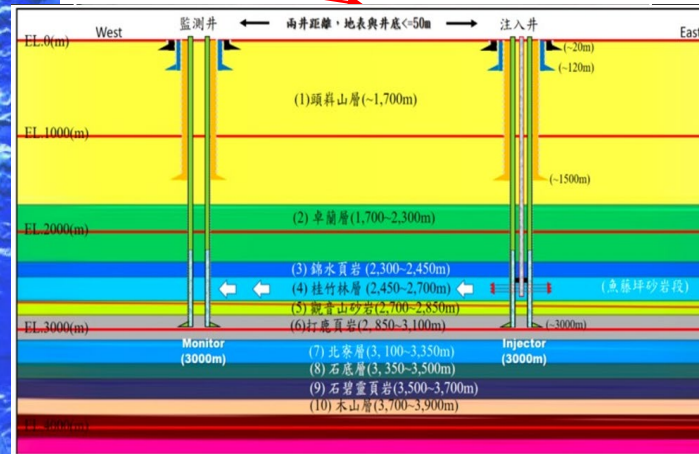


# Two field test sites announced 2023

## TPC - Taichung power plant field test site



- Deep saline aquifer storage test. ~ 3,000m depth
- Target size: 30,000 tonnes
- Injection period: 15 years
- Injection rate: 2,000 tonnes/year
- Status: EIA (Environmental Impact Assessment) update approved in March 2023

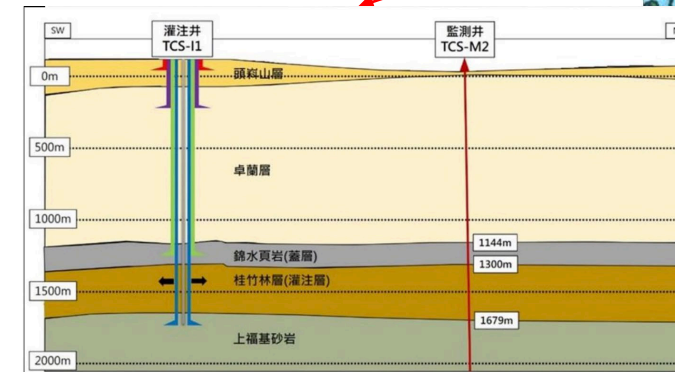


Source: Lin et al. NEP II. 2014. Atlas for Geological Storage of Carbon Dioxide in Taiwan.

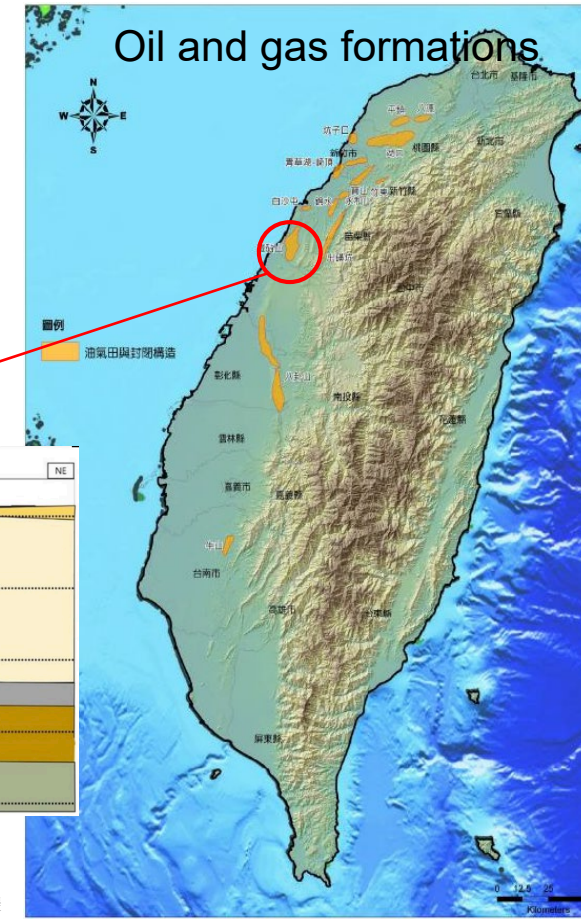
Source: 天下雜誌(2023).「碳捕捉」是什麼？發電減碳新技術 台電如何「捕」CO<sub>2</sub>、要封存在哪裡？<https://www.cw.com.tw/article/5126479>  
台灣電力股份有限公司(2023). (1120084A) 台中發電廠第九、十號機發電計畫環境影響說明書第六次變更內容對照表

## CPC - Tiehchenshan gas field test site

- Saline auifer in a gas field. ~ 1,700m depth.
- Target size: 30,000 tonnes
- Injection period: 3 years
- Injection rate: 10,000 tonnes/year
- Status: EIA (Environmental Impact Assessment) update approved in July 2023



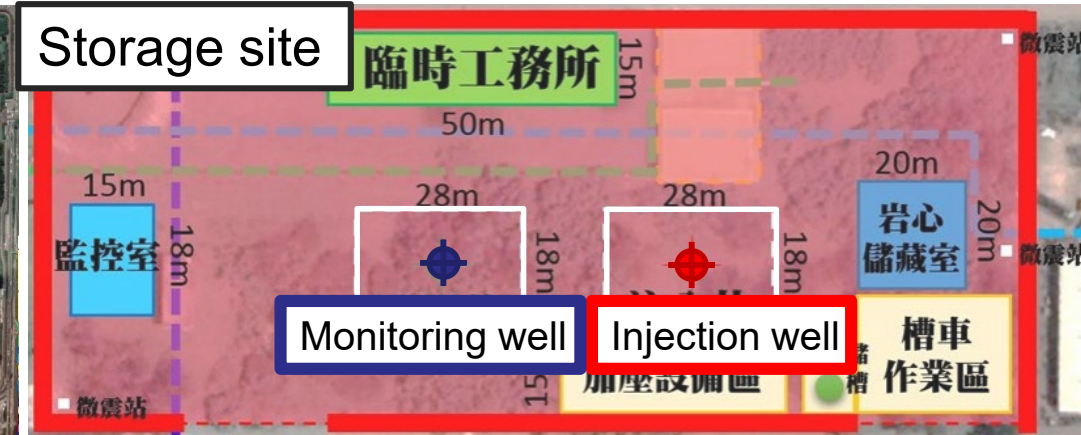
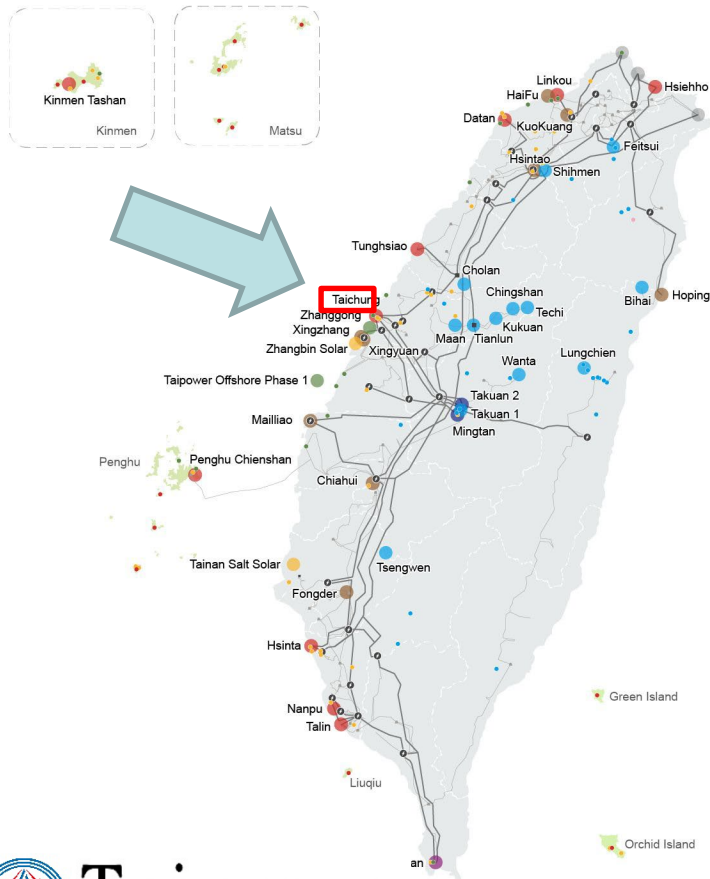
Source: 環境資訊中心(2023)中油碳封存計畫過環評估3年封存30萬噸二氧化碳  
<https://e-info.org.tw/node/237260> ;  
台灣中油公司(2023). (1120394A) 鐵砧山地區天然氣注、產氣井開發計畫環境影響說明書第四次變更內容對照表



Source: Lin et al. NEP II. 2014. Atlas for Geological Storage of Carbon Dioxide in Taiwan.

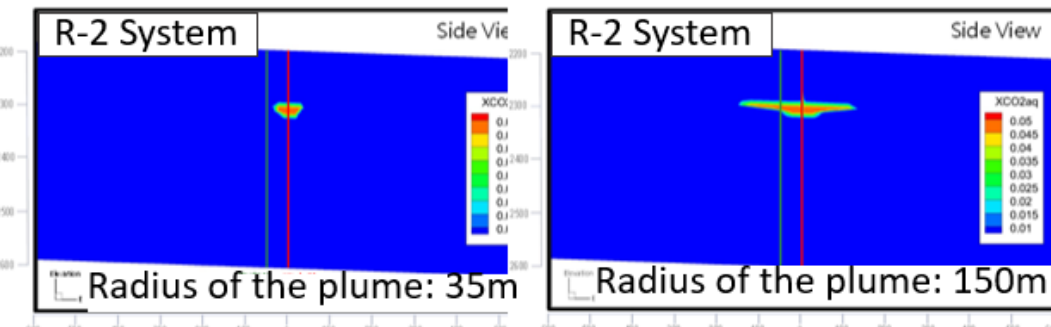
# Taipower's carbon storage research project

The location of the carbon storage research project site



- A two-well storage project is proposed.
- A 3,000m deep injection well, proposed capacity is 2,000 tons CO<sub>2</sub> per year.
- A 3,000m deep monitoring well for detecting CO<sub>2</sub> plume.

- Simulation of CO<sub>2</sub> plume migration  
**1 yr after injection (2,000 tons)**      **15 yr after injection (30,000 tons)**



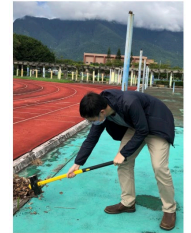


# CCS research in ITRI

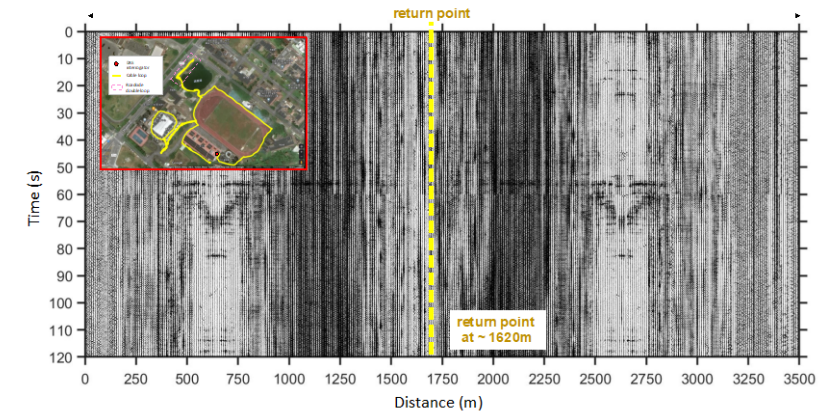
- Geological storage potential and site assessment update
- Development of distributed fiber optic sensing technologies for monitoring CCS sites
- Development of site-specific quantitative risk assessment methods for CCS site application
- Industrial application tests of calcium-based CO<sub>2</sub> capture technology in iron and steel sector and development of indirect carbonation system utilizing diversified calcium sources
- Promotion of MOEA CCS R&D alliance and “sandbox” field test working group through various domestic activities and international exchanges and collaborations

ITRI GEL and ICL, Academia Sinica IES and universities are collaborating in knowledge sharing and education through joint lab DAS (distributed acoustic sensing), surface DAS and wellbore DAS tests.

## ITRI - NDHU/IES - Campus test



DAS signals of the whole IES NDHU loop



Source: ITRI (2023) FY111 碳捕存再利用整合示範計畫(1/3), MOEA BOE. ; Yang et al. (2023). "Near-surface monitoring technologies for geologic carbon storage", 5<sup>th</sup> Asia Pacific Meeting on Near Surface Geoscience & Engineering. European Association of Geoscientists and Engineers (EAGE) & Taiwan Geotechnical Society (TGS)



## Acknowledgments

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# Thank you

Comments and Questions