



Taiwan's Net-Zero Strategies in Agriculture Sector 臺灣農業部門淨零排放策略

Climate Change Program Office

氣候變遷調適及淨零排放專案辦公室

Council of Agriculture, Executive Yuan

行政院農業委員會

Outline大綱

1. Climate Change Impacts on Agriculture

氣候變遷對農業的影響

2. Net-Zero Strategies in Agriculture Sector

農業部門的淨零策略

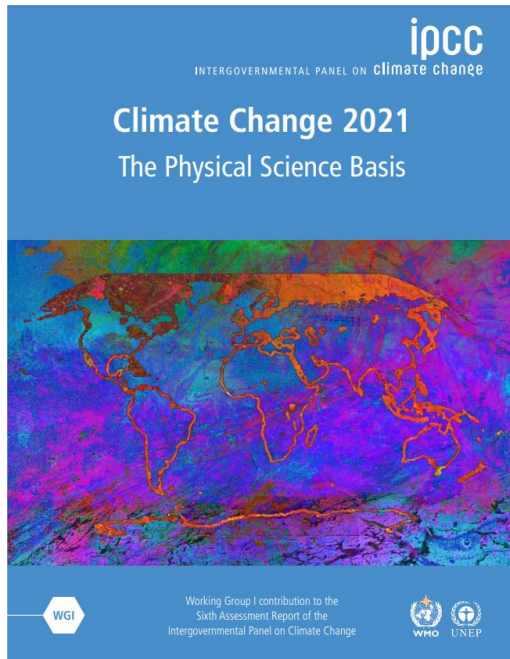
3. Conclusion

結論



Human Activities Really Mattered

人類活動影響很大



- ✓ Global warming is ongoing and is expected to increase 1.5°C in two decades.
全球持續暖化，未來20年內恐升溫超過1.5°C。
- ✓ The world needs to achieve net zero emissions to slow down the speed of global warming.
全球須在2050年左右達到淨零排放，始有可能減緩暖化速度。



- ✓ **Taiwan is facing much severe situation: 臺灣農業面臨挑戰:**
 - From 1991 to 2020, the annual average temperature has increased 1.6 °C.
1991-2020年間，全年平均溫度已上升1.6 °C，且有增溫加速趨勢。
 - Longer summer, shorter winter.
夏季增長冬季縮短。
 - Drought, heavy rainfall, super typhoon, etc.
乾旱、強降雨、超強颱風等極端天氣發生頻度提高。

GHGs Emissions in Agriculture

農業部門溫室氣體排放現況

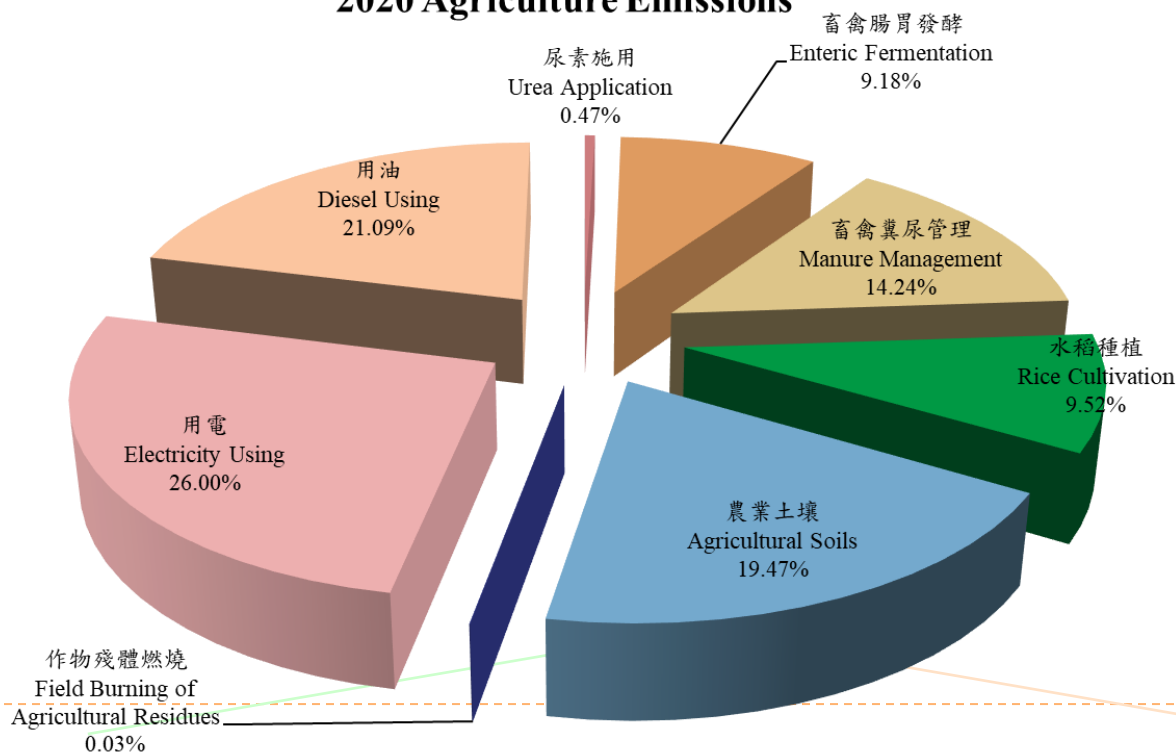


- In 2020, the agricultural sector emitted 6.3 million tonnes CO₂e of GHGs, accounting for 2.22% of the total.
2020年農業部門溫室氣體整體排放占全國排放2.22%。



2020 農業部門溫室氣體排放

2020 Agriculture Emissions



Net-Zero Strategies in Agriculture Sector

農業部門淨零策略

1. Adaptation 調適

2. Reduce Carbon Emission 減量

3. Enhance Carbon Sink 增匯

4. Circular Agriculture 循環

5. Green Trend 綠趨勢



Adaptation 調適



**Lower climate risk, Construct resilient agriculture,
Secure food security, Maintain biodiversity**

降低氣候風險，建設有復原力的農業，保障糧食安全，維護生物多樣性

Reduce Carbon Emission 減量

1. Build an agriculture carbon emission data platform.

全面建立農業生產碳排資訊

2. Develop low carbon farming technology (e.g. paddy water management).

建立低碳農糧生產模式

3. Adopt precision fertilization and pesticides.

採用精準施肥和農藥

4. Adopt precision nutrition and feeding systems.

採用精準的營養和飼養系統

5. Push forward the use of electronic farm machinery.

推廣智慧型農業



Rice Husk Furnace 稻殼(粗糠)取代燃油



Use **rice husk** as fuel instead of fuel oil (稻殼(粗糠)取代燃油 節能減碳)

Agriculture waste (農業剩餘資材)

Energy efficiency (能源效率)

- Maximum calorific value:
1.3 million kcal/ hour
粗糠爐設備最大發熱量
130萬 仟卡/小時

- COA had introduced **28** rice husk furnaces to food industry. 101年至今輔導糧食業者設置粗糠爐設備28組
- Reduction of carbon emissions = **10.9 kt CO₂-e per year**
每年減少10.9千公噸CO₂當量

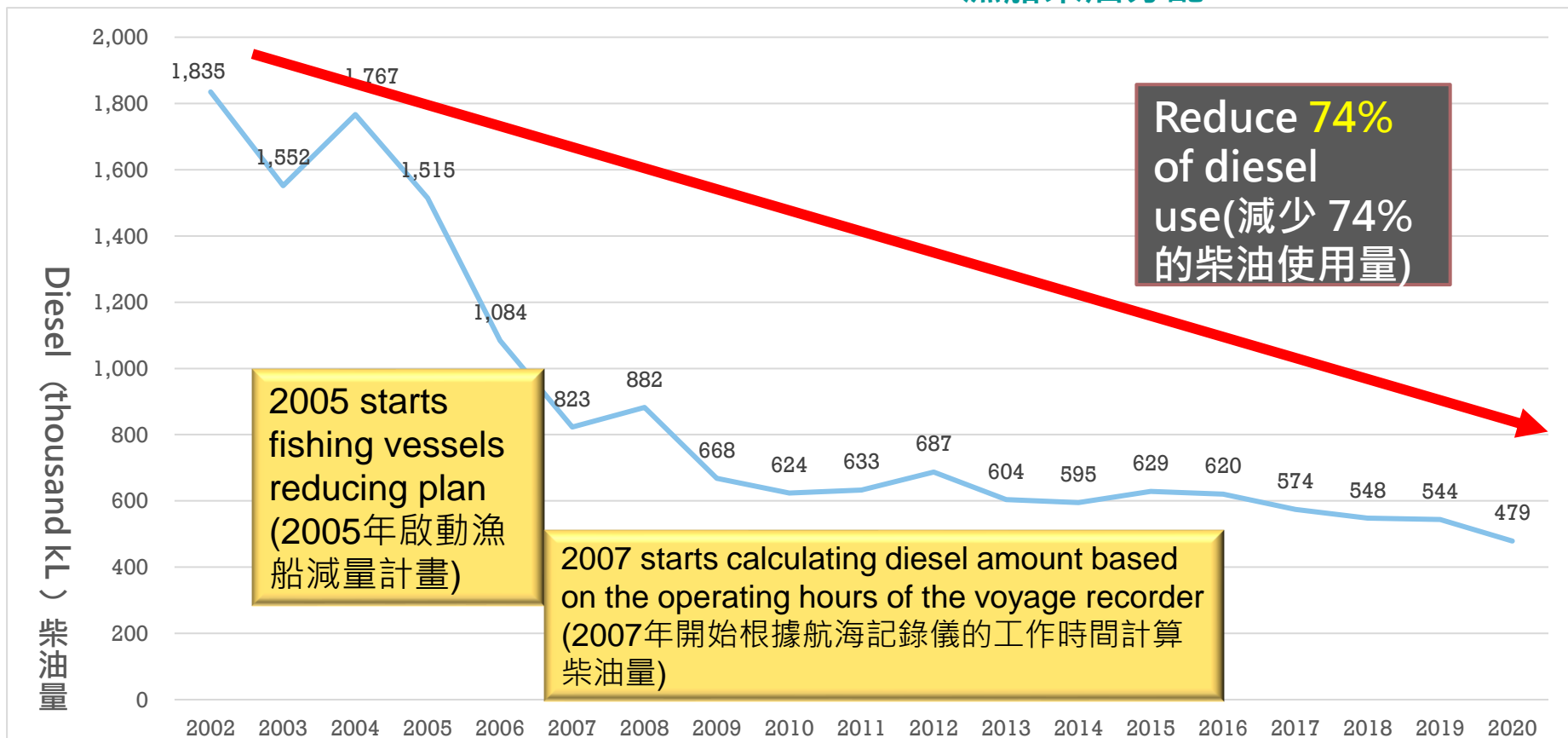
Carbon reduction (減碳效益)





Reduction of Fishery Fuel 減少漁業用油

Allotment of Diesel of Fishing Vessels 漁船柴油分配



All fishing vessels use energy-saving engines. 漁船使用節能設施

Enhance Carbon Sink 增匯

1. Enhance carbon sinks of forest, soil and ocean.

加強森林、土壤和海洋的碳匯

2. Strengthen forest, soil, ocean, and wet land management.

加強森林、土壤、海洋和濕地管理

3. Develop carbon negative farming methods (e.g. planting green manure crops).

建構負碳農法

4. Strengthen carbon sink R&D.

強化碳匯科技研發



Forest Carbon Sink 森林碳匯



Taiwan
Forest
Coverage
60.71%

臺灣森林覆蓋率60.71%

Taiwan Forest
Carbon Sequestration
臺灣森林碳匯

Forest Area:
2.2 million hectares
森林面積：220萬公頃

Carbon sink per year:
21.14 million tonnes CO₂

每年的碳匯：2,114萬公噸二氧化碳



Circular Agriculture循環

1. Turn agriculture residues into resources and energy. 農業剩餘資源材料化與加值再利用

2. Promote reuse of manure. 推動畜禽糞尿再利用

3. Enhance biogas and biomass efficiency. 提高沼氣和生物質能效

4. Build cross-disciplinary circular agriculture demonstration sites. 推動農業跨域循環場域

5. Encourage circular agriculture cooperation among countries, enterprises, and sectors. 透過跨國、跨企業與跨部會進行農業循環合作

Biogas Reuse in Livestock Farms

畜牧場沼氣再利用



Till 2020 截至2020年底

Biogas from **2.5 million** pigs
Reuse for **heating** and **generating electricity**

250萬頭豬全年沼氣產量作為燃料使用



Electricity generation

⚡ 6.0MW Can afford
10,200 household
發電量6.0MW可供10,200戶
一般家庭人使用



Saving gas fee

Up to **430 million** NTD
per year
每年可省下4.3億元天然氣燃料費

Reducing GHG emission

59 kt CO₂-e
每年可減少5.9萬公噸
溫室氣體排放

GHG emission per year

208,500 motors
機車全年20萬8,500台
碳排放量



行政院農業委員會
COUNCIL OF AGRICULTURE, EXECUTIVE YUAN



Green Trend 綠趨勢

1. Promote green energy (solar energy, fishery and electricity symbiosis, small hydropower).

推廣綠色能源（太陽能、漁業和電力共生、小水電）

2. Turn agriculture residues into energy.

將農業廢棄物轉化為能源

3. Set up agriculture carbon pricing and carbon credit trading system. 建立農業碳定價和碳交易系統

4. Drive the value of agricultural carbon sinks and carbon reduction. 推動農業碳匯與減碳價值化

5. Promote green finance and green consumption.

推動綠色金融和綠色消費

Conclusion 結論

Things to be done for the Taiwan's agriculture sector to reach net zero in 2040:

台灣農業部門提前於2040年達到淨零排放

- 1. Can not affect farmers' rights. 不影響農民權益**
- 2. Taiwan's agriculture net zero policy consists of 19 strategies and 59 measures. 臺灣農業部門淨零政策包括19項戰略和59項措施**
- 3. Agricultural GHGs emissions are expected to be cut in half. 預計2040年達到減少農業部門溫室氣體排放50%**
- 4. 10 million tonnes of natural carbon sink are expected to be added. 增加農業碳匯1,000萬公噸**