

The Theme of Oil and Gas Security Studies No. 20

“What are the energy security implications of recent declines in both APEC and global spare petroleum refining capacity?”

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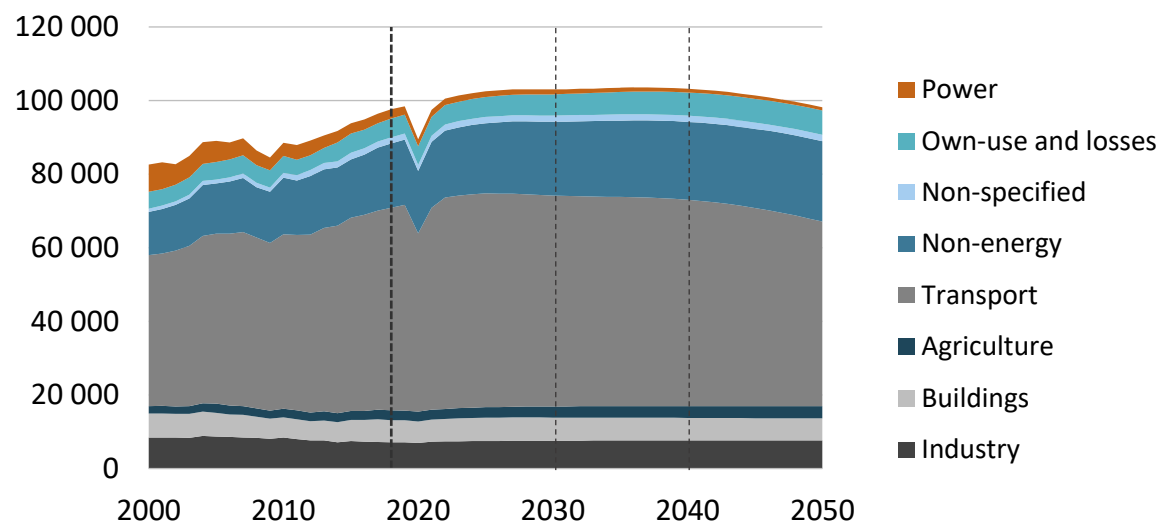
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Oil and petroleum products are expected to continue as important energy sources

- In REF scenario of the APEC Energy Demand and Supply Outlook 8th Edition (2022), sectoral petroleum product consumption continues to grow throughout 2030 (except in the power sector).
- The non-energy and transportation sectors have the largest volume increases in petroleum product consumption during 2018-2030, accounting at 2 500 and 2 300 PJ, respectively.

APEC Petroleum Products Consumption, REF (PJ)



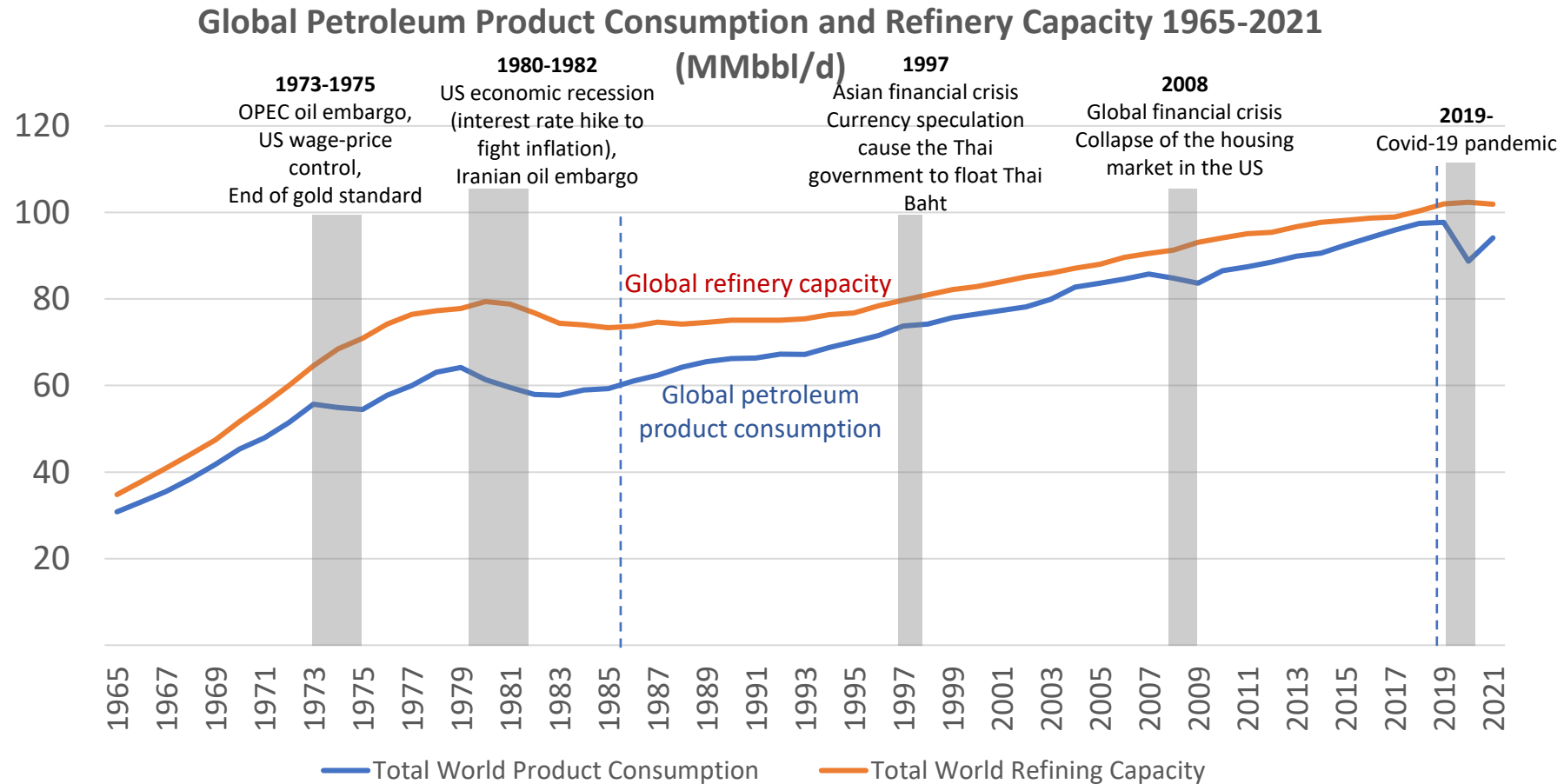
Source: APEC Energy Demand and Supply Outlook 8th Edition

Percentage change in petroleum product consumption, REF

	2018-2030
Industry	6.4%
Buildings	3.9%
Agriculture	14.4%
Transport	4.2%
Non-energy	14.3%
Non-specified	2.2%
Own-use and losses	12.6%
Power	-46.6%
Total	5.5%

Global refinery capacity has not kept pace with growing petroleum product consumption

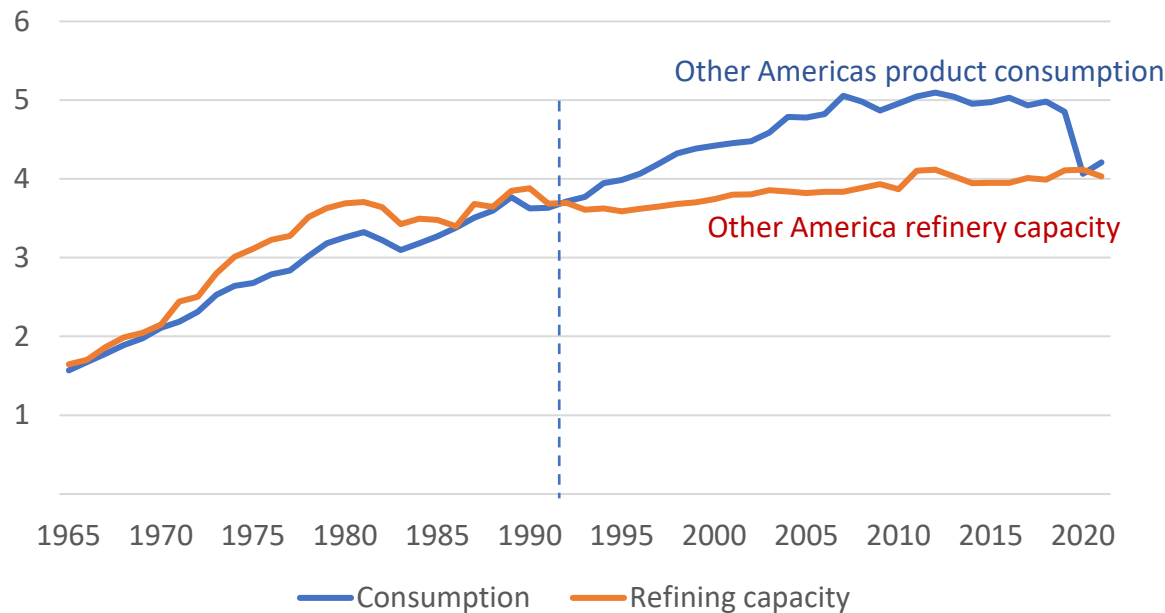
- Expansion in refinery capacity in the 60s and 70s was mainly to supply increasing petroleum product demand in Europe and the US.
- During 1985-2019, global petroleum refinery capacity did not follow petroleum products consumption, at 1.0% vs. 1.5% annual growth, respectively.



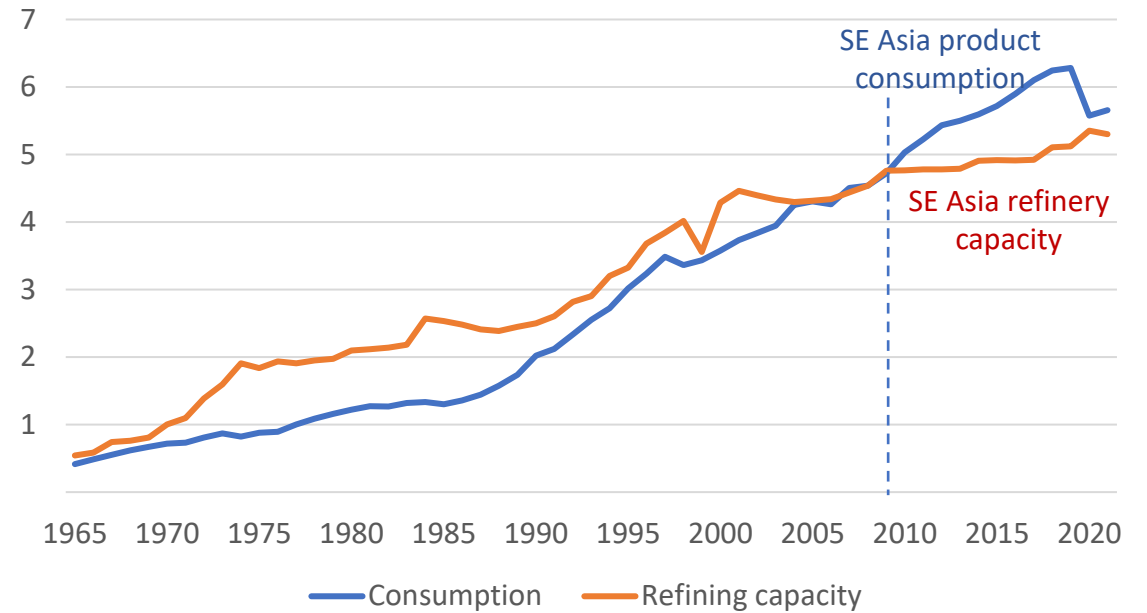
In APEC Other Americas and Southeast Asia sub-regions, petroleum product consumption has exceeded refinery capacity for over a decade

- Regional petroleum product consumption grew more quickly than regional refinery capacity for three decades in APEC Other Americas, and over a decade in SE Asia.
- The result was increased dependence on petroleum product imports.

APEC Other Americas' Petroleum Product Consumption and Refining Capacity (MMbbl/d)



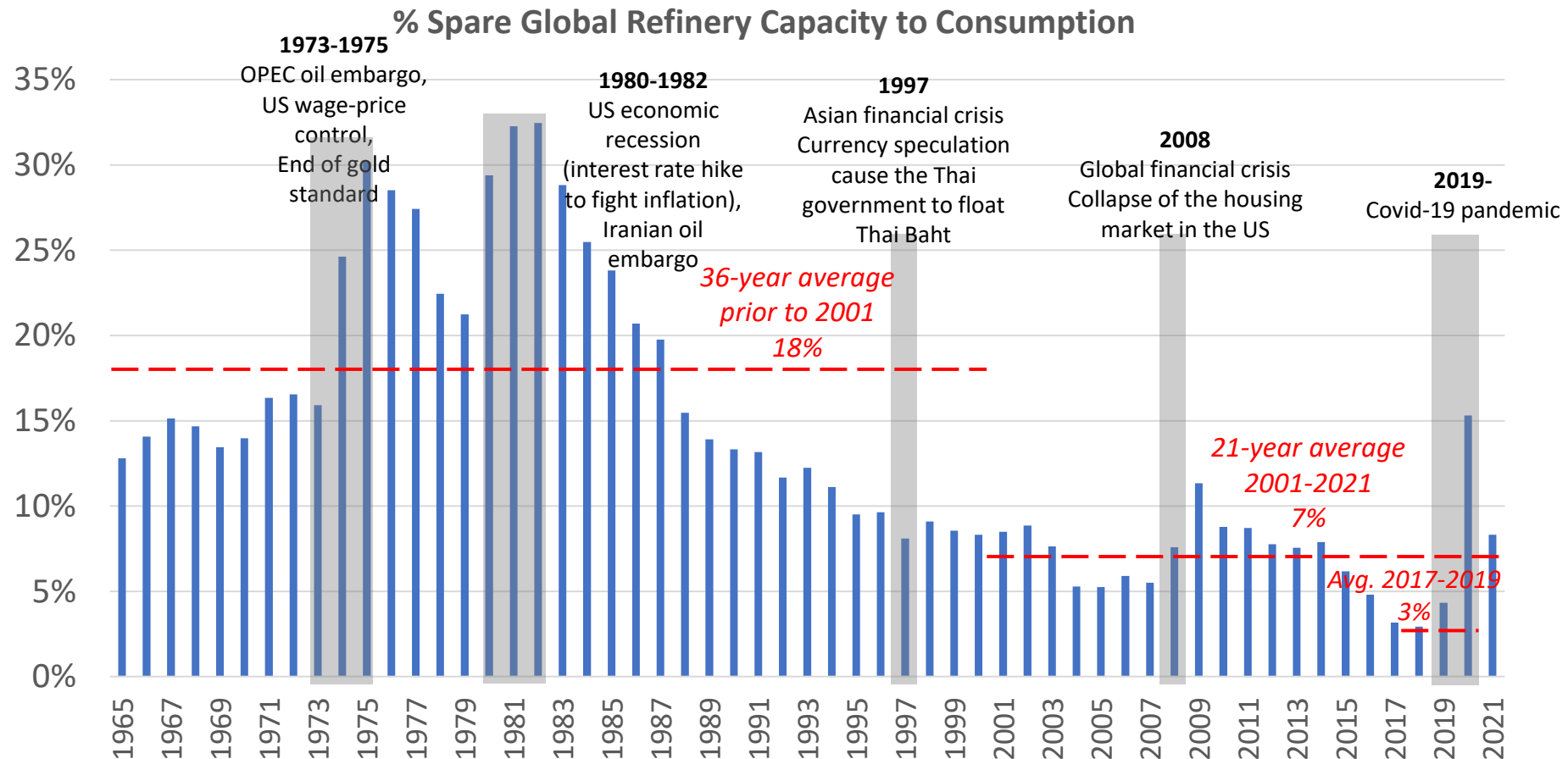
APEC Southeast Asia's Petroleum Product Consumption and Refining Capacity (MMbbl/d)



Source: BP Energy Statistics 2022 and APERC analysis

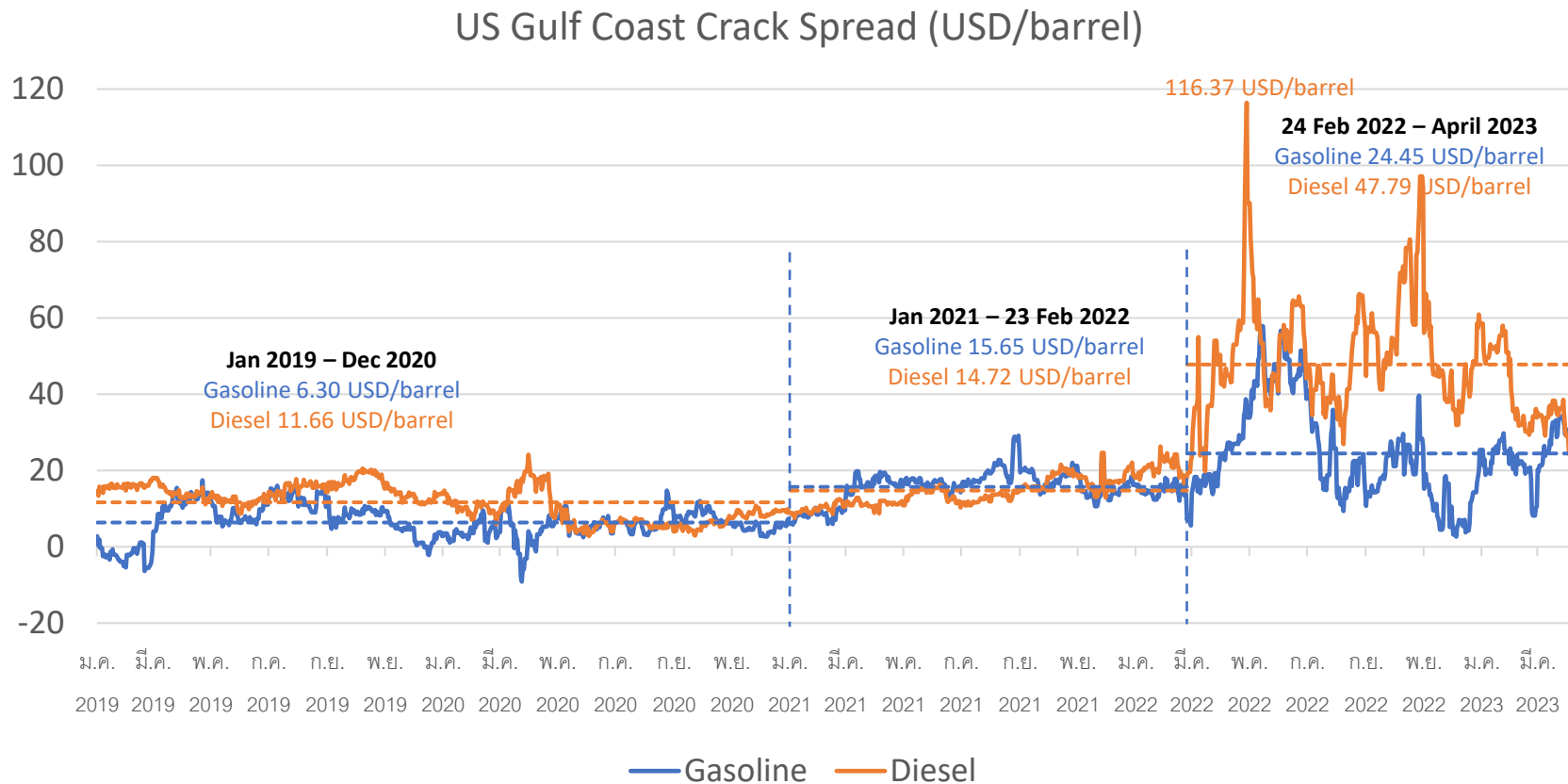
Globally, the ratio between spare refinery capacity to product consumption shows a declining trends, posing challenges of supply security of petroleum products.

- Average ratio of spare refinery capacity¹ over consumption reduced from 18% prior to year 2000 to 7% post-2000.
- More recently, the ratio decreased to average 3% during 2017-2019 prior to the COVID-19 pandemic.



Low level of spare refining capacity in APEC and the world likely contributed to increases in gasoline and diesel crack spreads

- Average US Gulf Coast gasoline crack spread² increased from 6.30 USD/bbl to 15.65 USD/bbl during 2021-2022 prior to Russia-Ukraine war, and increased further to 24.45 USD/bbl after the war started.
- Average diesel crack spread showed similar trends, with its peak at a historic 116.37 USD/bbl on 28 April 2022.



Source: IEA

Proposed Theme of OGSS No. 20:

What are the energy security implications of recent declines in both APEC and global spare petroleum refining capacity?

More specific questions:

1. What is the relationship between spare refining capacity and petroleum product prices?
2. What level of spare refining capacity is needed to ensure petroleum product supply security ?
3. What is the current outlook of investment or disinvestment in petroleum refinery capacity?
4. What are the energy security issues associated with domestic refining capacity versus petroleum product imports?
5. What measures can APEC economies take to improve the security of their petroleum product supplies?

Scope of study

- 1. Supply security of petroleum products from refinery:** Focus will be on two main petroleum product groups: light distillates and middle distillates.
- 2. Geographical coverage:** Covering both within and outside of APEC in order to be able to identify global consumption and supply capabilities of petroleum products.
- 3. Level of analysis:**
 - Analysis to evaluate supply strategy and supply security of petroleum products of individual economy.
 - Study of existing measures of individual economy including petroleum product stockpiling.

Thank you

