

3-5. APEC Oil and Gas Security Studies No. 22: *The Energy Security Implications of Upstream Oil Investment*

APERC Workshop

The 72nd Meeting of APEC Energy Working Group (EWG72)
7 September 2026 – Beijing, China

Mr. Thanan Marukatat, Research Fellow, APERC

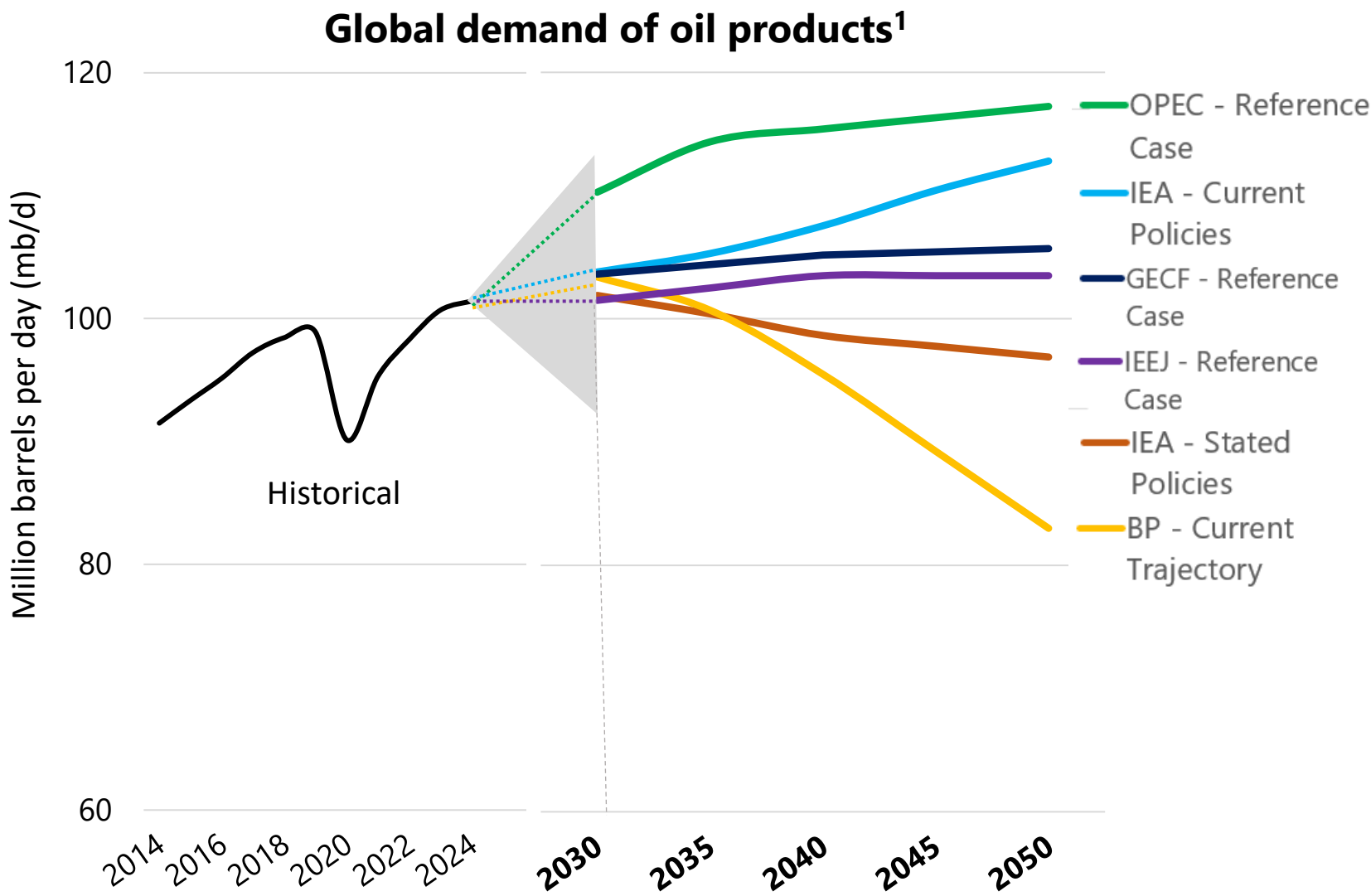


Highlights of OGSS No. 22

1. **Demand:** Oil demand projected to grow at least through the 2030s
2. **Production:** Increased crude oil production required to meet demand
3. **Declines:** Rapid decline rates observed in existing production fields
4. **Gap:** Widening gap between actual and required global upstream oil investment
5. **Geographical concentration risk:** Strategic investment is essential to mitigate regional supply concentration risks.
6. **Action:** Policy considerations for decision-makers

1) Oil demand

Projected global oil demand by selected institutes



Global oil demand is forecast to reach 102 - 110 million barrels per day (mb/d) in 2030;

IEA (Current Policy)

Growth to 104 mb/d by 2030, rising to 114 mb/d by 2050

IEA (Stated Policy).

Demand peaks at 102 mb/d in 2030, followed by a decline

OPEC (Reference Case)

Steady growth to 110 mb/d by 2030, reaching 117 mb/d by 2050

BP (Current Trajectory)

Peak at 103 mb/d in 2030, followed by a rapid decline

IEEJ and GECF (Reference Cases)

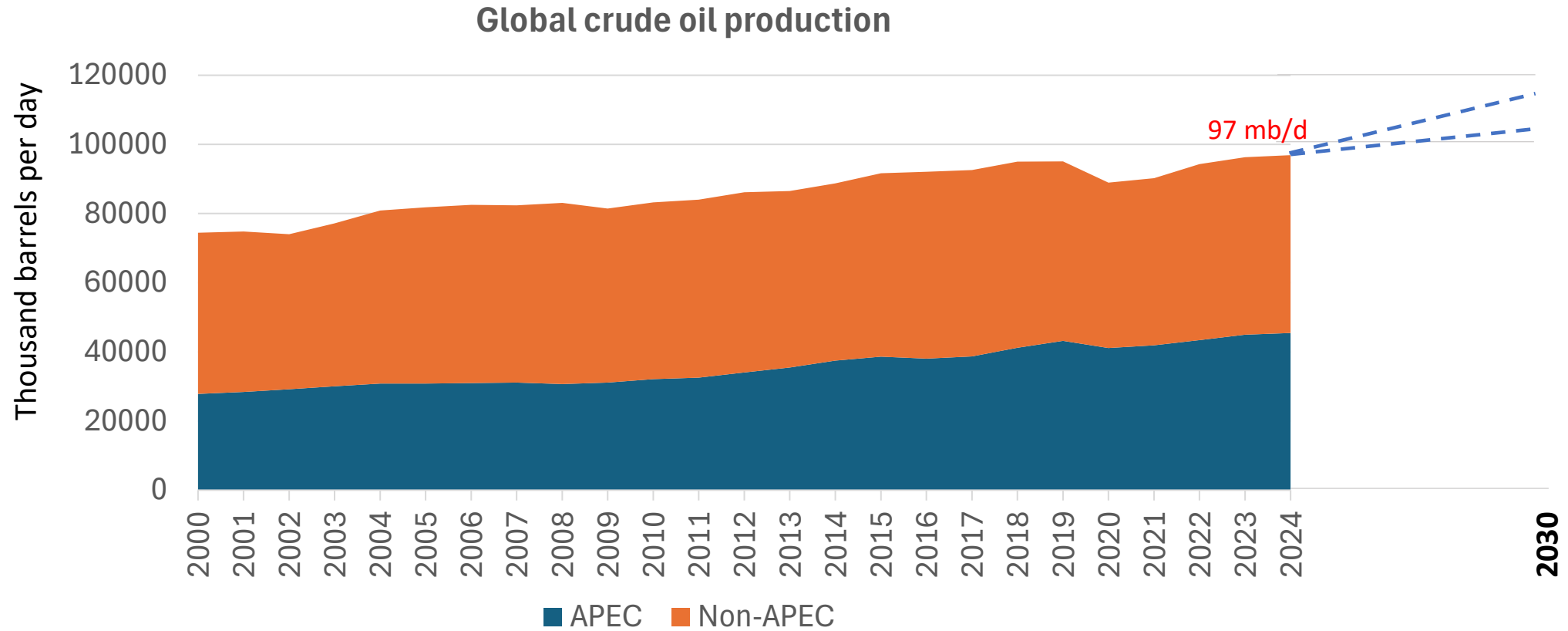
2030 demand at 102 and 104 mb/d; peaks/plateaus expected after 2040

1-Demand not including biofuels

Source: IEA, OPEC, BP, IEEJ, GECF, chart by APERC

2) Crude oil production

Crude oil production

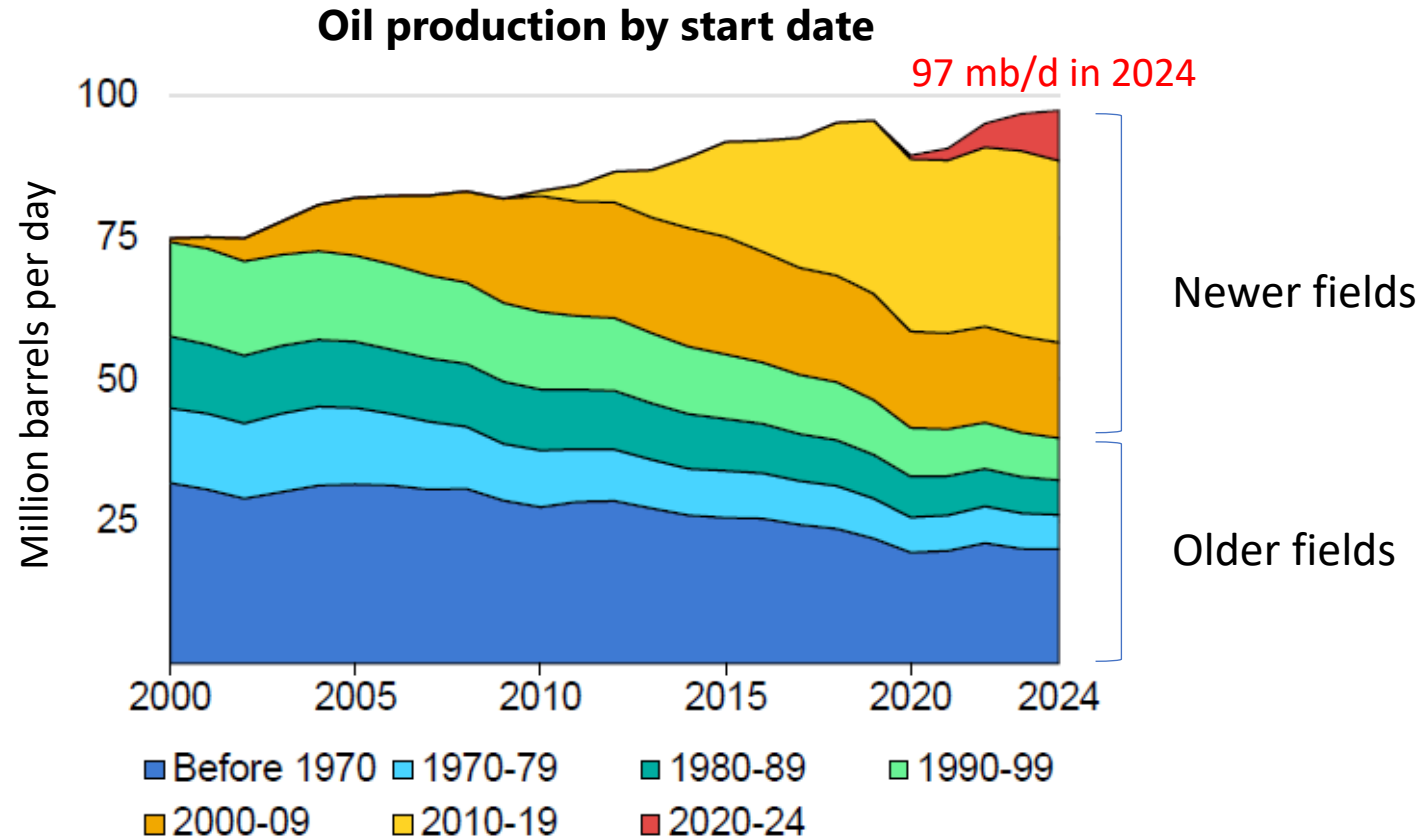


Source: EGEDA and Energy Institute (EI), chart by APERC

- **Current Status:** Global crude production stood at 97 mb/d in 2024.
- **The Challenge:** Substantial supply increases are necessary to meet the 102–110 mb/d 2030 demand.

3) Rapid decline rates in existing production fields

Production outlook by field age

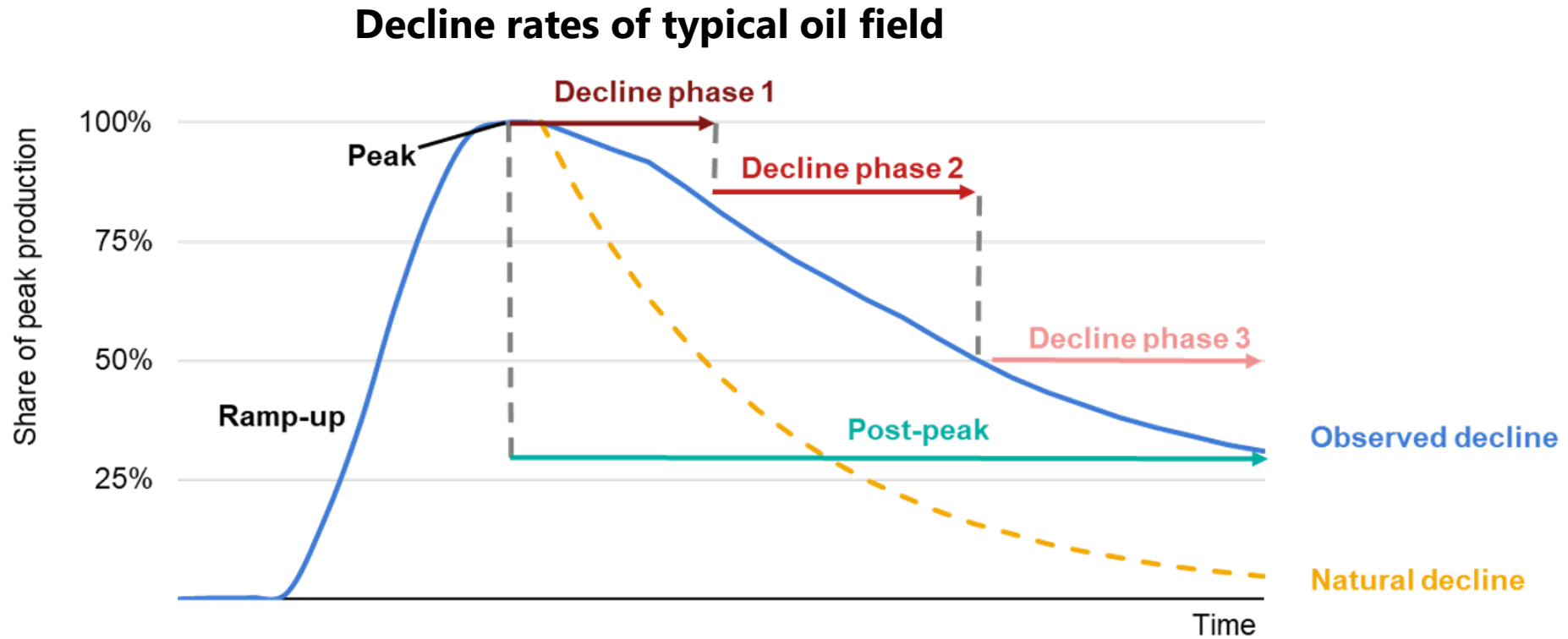


Notes: Each band represents oil fields starting productions in the same period.

Source: IEA, The Implications of Oil and Gas Fields Decline Rates, 2025

- **Field Decline:** Output from older fields is declining steadily despite ongoing maintenance capital.
- **New Investment:** Continuous investment in new assets is also vital to offset field declines.

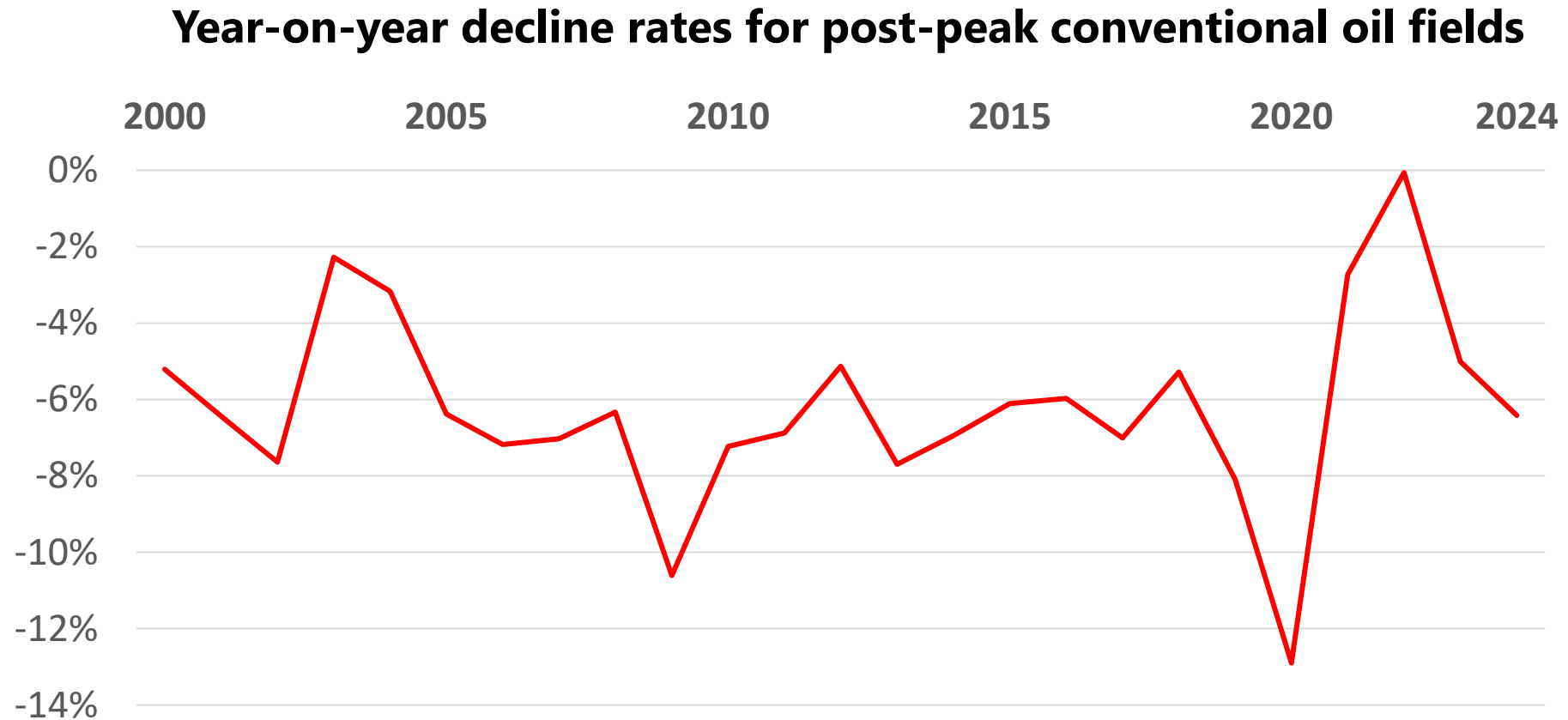
Post-peak fields require significant ongoing investment to slow their decline



Source: IEA, The Implications of Oil and Gas Fields Decline Rates, 2025

- Lack of capital investment leads to rapid natural declines in production.
- Ongoing investment is vital to manage the three phases of decline.

Decline trends in existing conventional oil fields



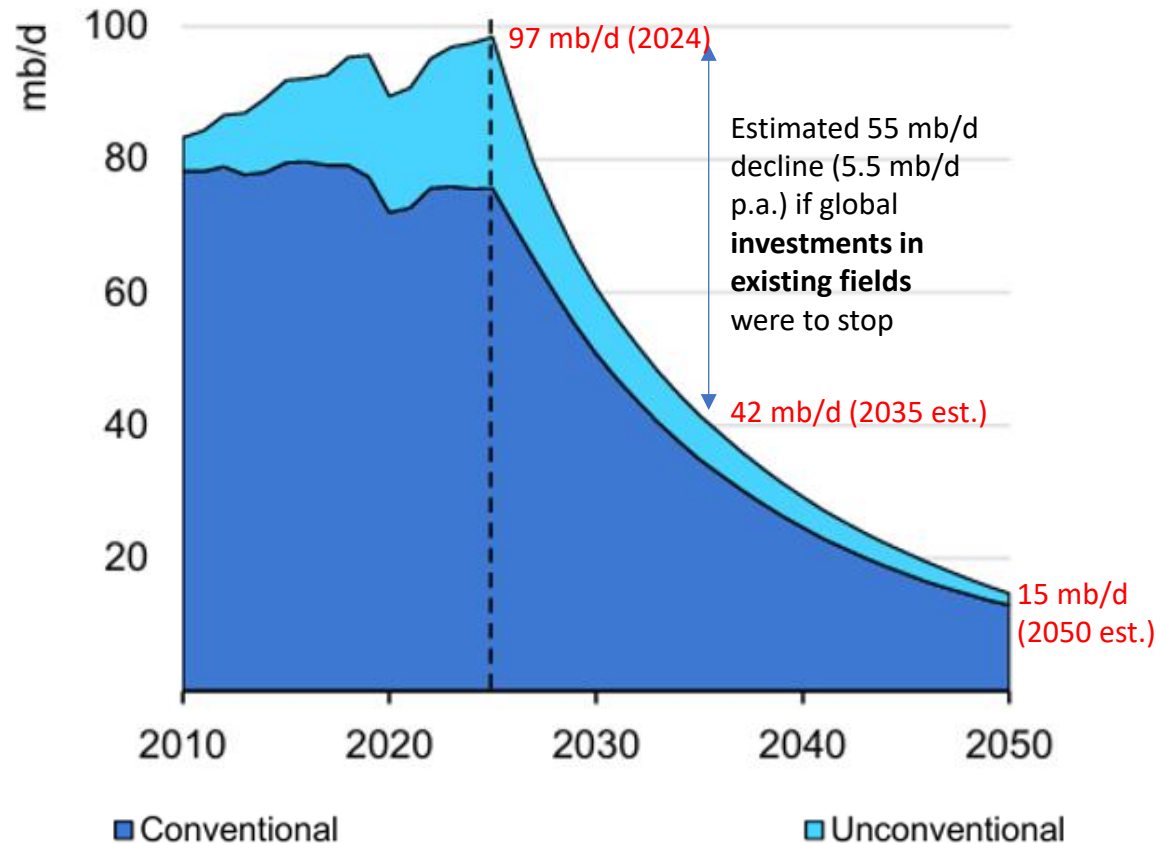
Notes: The simple year-on-year decline rate takes the sum of production output from all post-peak fields in a given year and compares it with production from the same set of fields in the previous year. The sample of fields included in the assessment of each year will change as new fields pass their peak in production and as fields are shut in.

Source: IEA, The Implications of Oil and Gas Fields Decline Rates, 2025

- Conventional oil fields are declining at average **5.6%** annually despite continued investment.

Risks of under-investment: potential supply crisis

Global oil production with natural declines* from 2025



Source: IEA, The Implications of Oil and Gas Fields Decline Rates, 2025

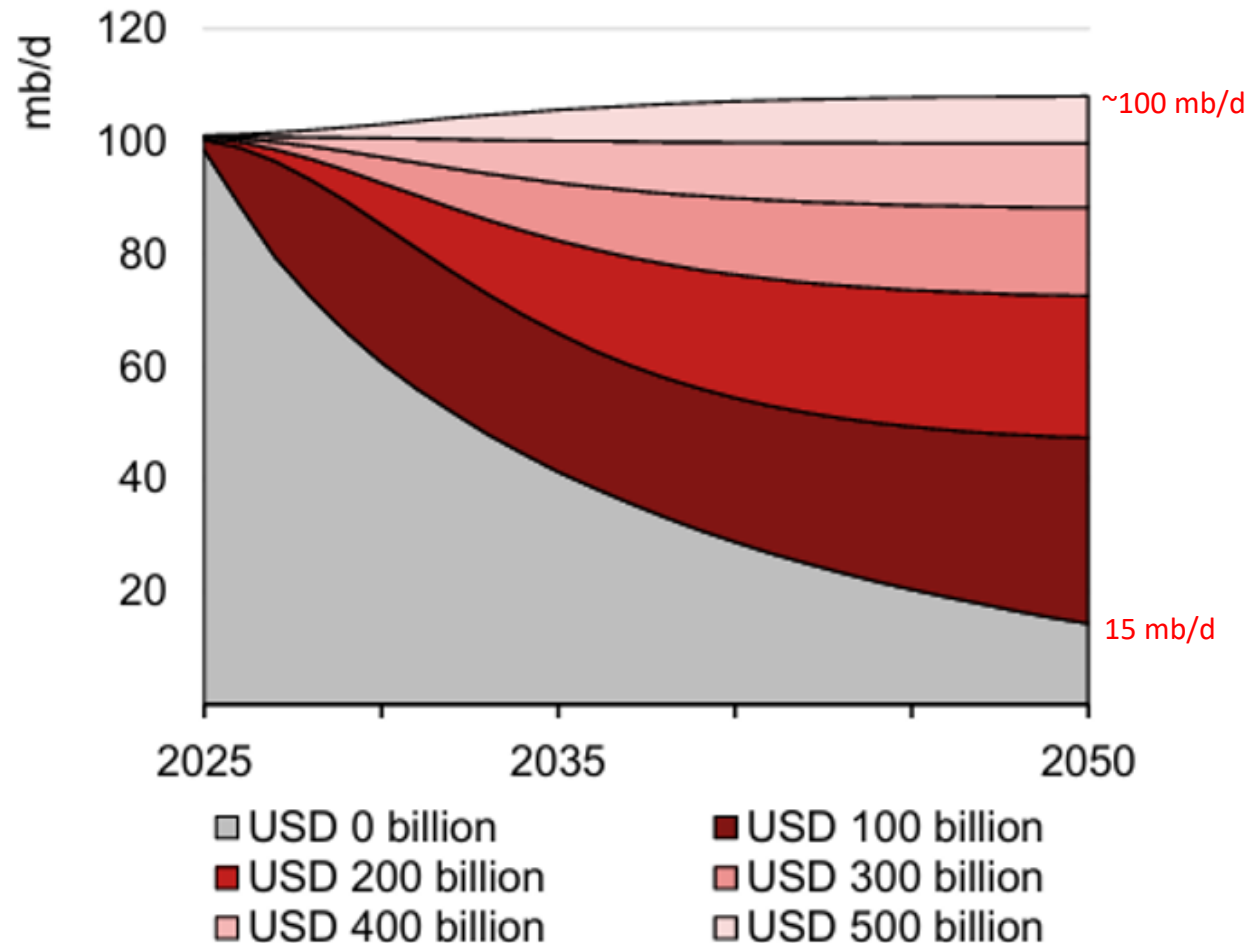
Note: * Natural declines begin from the end of 2025 assuming no investment.

- **Natural Decline:** Stopping investment from 2025 would lead to an 8% annual decline through 2035.
- **Volume Loss:** Equates to a structural loss of 5.5 mb/d annually (for comparison, the Strait of Hormuz crisis caused a ~14 mb/d disruption).
- **Long-Term Impact:** Global production would collapse to 42 mb/d by 2035 and 15 mb/d by 2050, or sooner in case of unpredicted supply disruption.

4) Widening gap between actual and required global upstream investment

Investment requirements for production stability

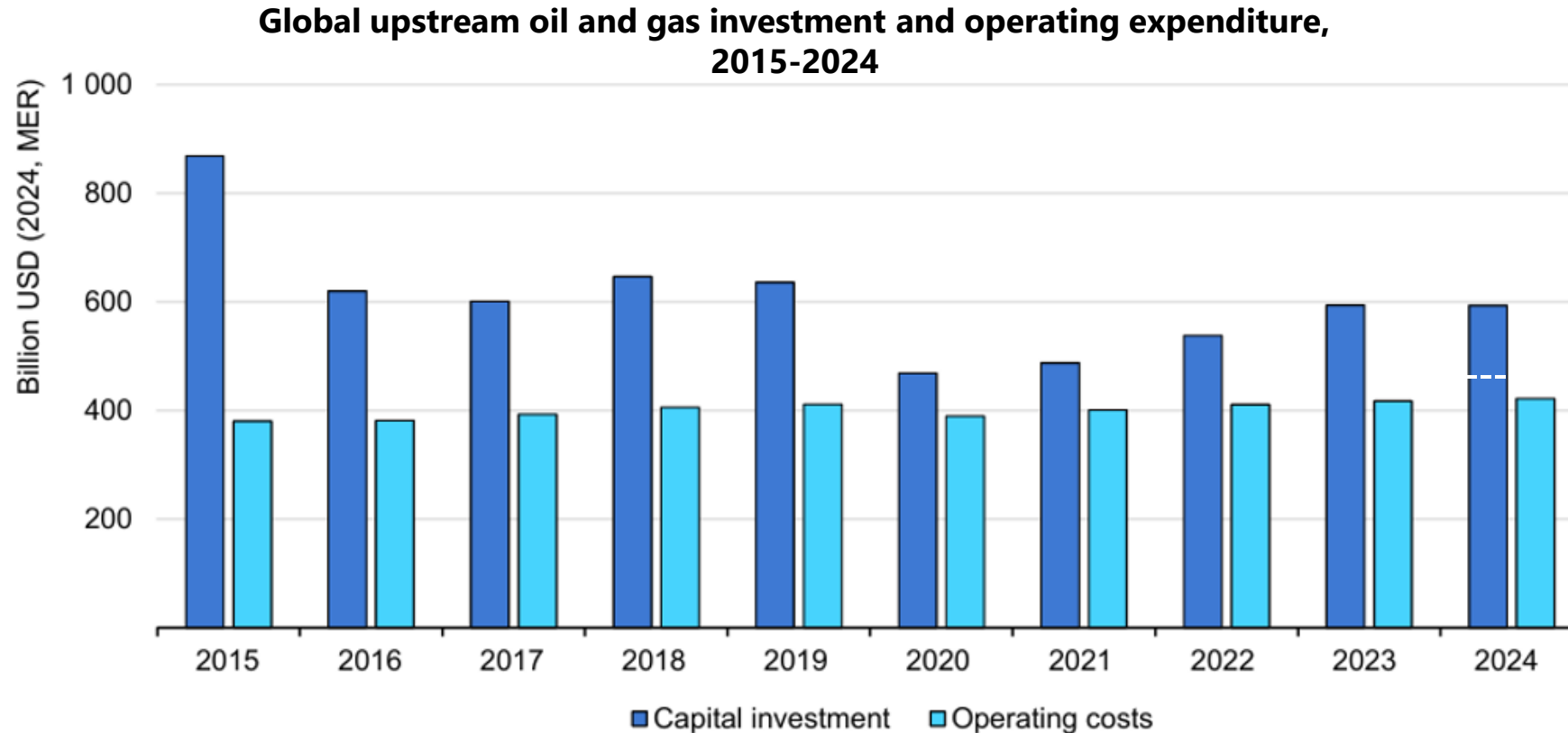
Global oil production at varied average annual upstream investment levels to 2050



Source: IEA, The Implications of Oil and Gas Fields Decline Rates, 2025

- An average annual investment of about **\$500 billion** is needed for enhanced oil recovery (EOR) and new developments to hold production at ~100 mb/d through 2050.
- Even at this level, production falls short of the forecasted 114 mb/d or 117 mb/d demand by some institutions.

Trends in capital investment and operating costs in upstream oil and gas



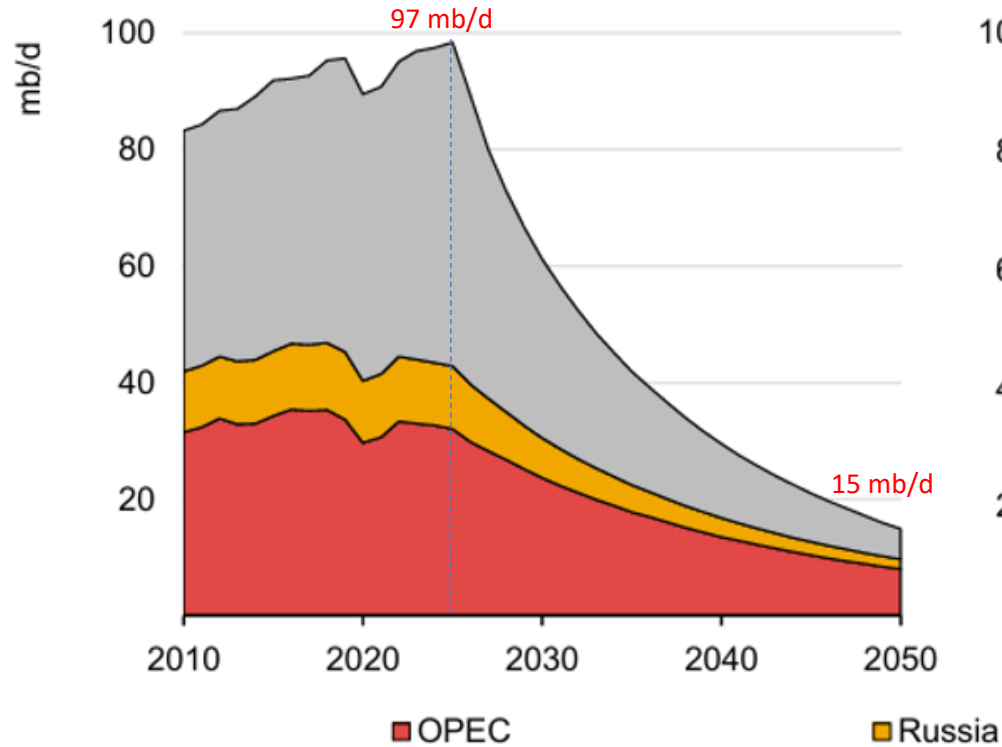
Source: IEA, The Implications of Oil and Gas Fields Decline Rates, 2025

- **Investment Gap:** Upstream oil and gas investment fell sharply in 2020 and remains below pre-pandemic levels.
- **Security Risk:** While operating costs are stable, 2024 upstream oil capital investment (\$450B) is insufficient for long-term security.

5) Risk of supply concentration

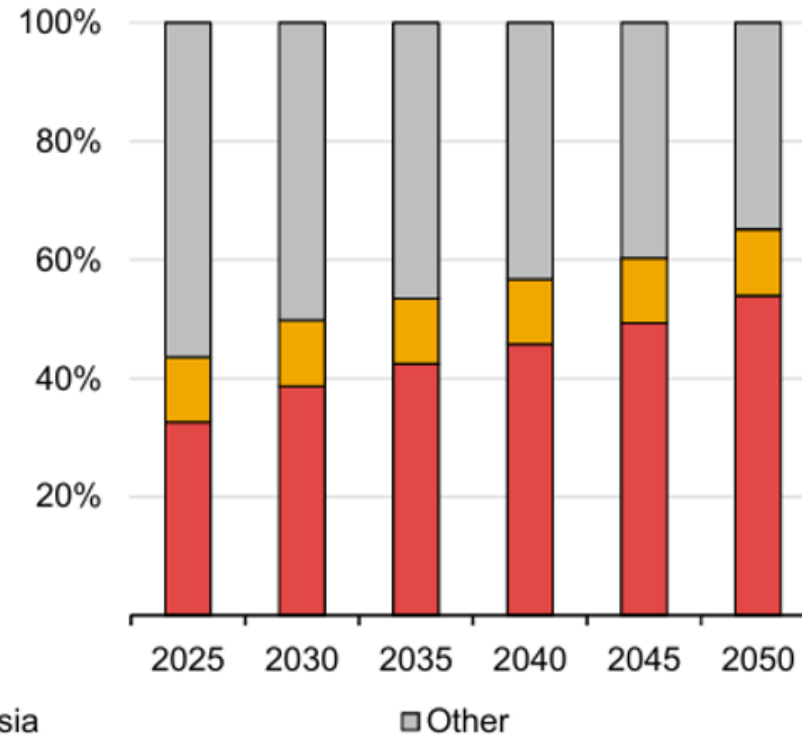
Supply concentration impacts

Natural decline rate for global oil production
in selected regions to 2050



Source: IEA

Global oil supply mix



- Without new investment, global supply will become increasingly concentrated within OPEC.
- Strategic upstream investment is required in many other economies to maintain a diversified and secure global supply.

6) Conclusions and considerations for policy makers

Key conclusions

1. **Legacy fields dominate:** The vast majority of current global oil supply relies on post-peak oil fields experiencing steep natural declines.
2. **Escalating security risks:** Rapidly declining fields threatens long-term supply stability and could result in geographical concentration risks.
3. **Ongoing capital injection required:** Substantial and sustained upstream investment in both legacy and new fields is critical at least to meet medium-term demand.
4. **Demand uncertainty dampens investment:** A decade-long decline in upstream oil capital investment stems from business decision to shift from long-term payoff oil projects under uncertain demand forecasts.

Considerations for policy makers

1. **Long-term planning:** Monitor and evaluate supply decline rates to strengthen energy security and trade policy frameworks.
2. **Investment support:** Develop policy mechanisms to incentivize ongoing upstream investment across NOCs and private entities.
3. **Supply diversification:** Diversify crude and oil product supply sources and continuously monitor their investment trends to stay ahead of future constraints.
4. **Energy transition:** Accelerate technologies and policies such as fuel economy measures, transport fuels diversification (EV/LNG/biofuels) that mitigate oil exposure, especially for import-dependent economies.
5. **Stockpiling:** Evaluate national stockpiles and regional cooperation to insulate against supply shocks.

Comments from the 9th OGSN Forum and EGCFE 2026

- 1. Capital sourcing and policy incentives:** Structural policies and incentives balancing NOCs' and private operators' investments in upstream oil.
- 2. Risk management:** Managing financial exposure in upstream investment amid future demand and transition uncertainties.
- 3. Strategic reserves:** Evaluating the benefit of oil stockpiling and regional cooperations across short, medium, and long horizons.

Timeline of OGSS No.22

August 2026: Final draft delivery

September – October 2026 : EWG circulation & endorsement

Q4 2026: Official publication on APEC Website

Thank you for your kind attention.

<https://aperc.or.jp>

Thanan.marukatat@aperc.or.jp

