

Plastic Money:

Turning off the subsidies tap

Scope of study

Subsidy support provided to the PPP industry was estimated for:

Price Related Subsidies (Phase 1 & 2)

- **Feedstock Subsidies:** Focus on fossil-derived feedstocks, including polymer precursors (e.g., propylene, ethylene)
- **Process Energy Subsidies:** Consumption of energy in the polymer and monomer production processes

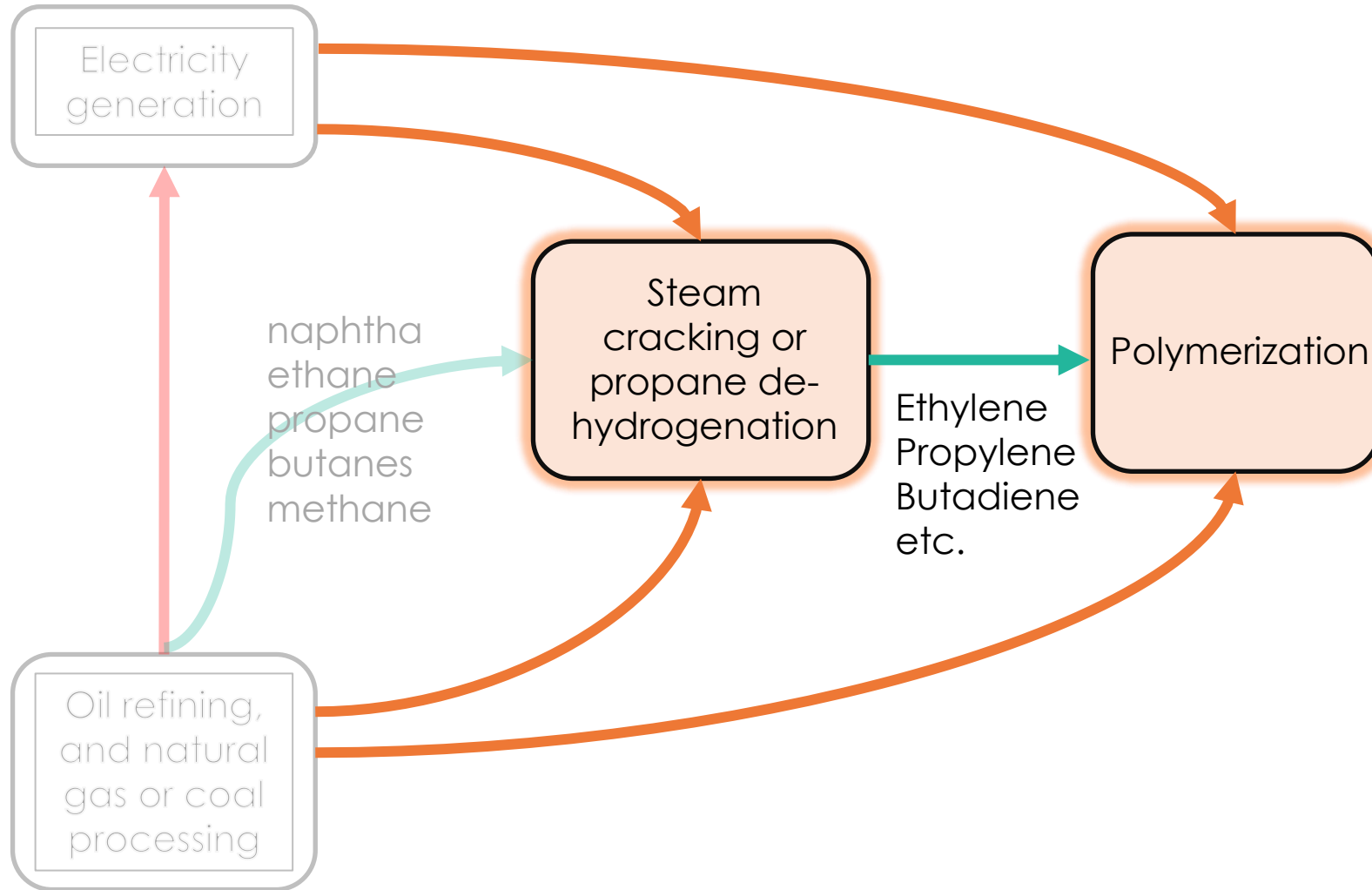
and

Investment and Other Subsidies (Phase 3)

- **Grants:** Direct financial contributions
- **In-kind subsidies:** Non-cash benefits
- **Tax expenditure subsidies:** Tax liability reduction through credits, exemptions
- **Below-market financing/credit support:** Financial assistance at more favourable terms than the market

A **baseline scenario** and a **full subsidies removal scenario** were modelled for 71 polymer producing countries in the world covering **7 primary polymers** (HDPE, LDPE, LLDPE, PP, PET, PVC and PS)

Boundary of price-related subsidies



**Price support for
chemical
feedstocks and
process energy**

Methodology: Feedstock subsidies

¹ IMF Fossil Fuel Subsidies Data: 2023 Update database

² IEA World Energy Balances database

³ OECD Global Plastics Outlook: Policy Scenarios to 2060

Estimated subsidy rates by polymer & country

- Feedstock subsidy rates (USD/tonne feedstock) obtained from IMF¹.
- Data available by country, feedstock type and end-user.
- Subsidy rates calculated as: *Cost of Supply* - *Consumer Price*. Positive values = subsidies.

Estimated polymer feedstock source by country

- IEA data² to estimate country-level feedstock splits (oil, NG, coal) for chemical use. Polymer production assumed to follow same trend as all chemical products derived from fossil fuels.

Estimated polymer production by country

- Polymer production volumes by polymer based on OECD data on polymer demand³.
- Production volumes broken down by country using Polyglobe production capacity data.

Estimated monomer consumption rate by polymer & source

- Literature-based monomer-to-polymer conversion rates applied.
- Conversion inefficiencies not accounted for, likely underestimating total subsidisation.

Calculated feedstock subsidy amount by country

- Level of subsidisation by country and polymer calculated by combining:
 - Subsidy rate by country & feedstock type (oil, NG, coal)
 - Polymer production volume by country & polymer
 - Monomer consumption rates
- Focused on feedstocks derived from fossil fuels. E.g., PVC made up of 45% ethylene. So, fossil-based feedstock consumption assumed to be 45%, multiplied by the monomer consumption factor obtained from literature.

Methodology: Energy subsidies

Estimated subsidy rates by source and country

- Feedstock subsidy rates (USD/GJ consumed) obtained from IMF data.
- Data available by country and energy source (electricity, NG, oil).
- Subsidy rates calculated as: *Cost of Supply – Industrial Consumer Price*. Positive values = subsidies.
- Lack of sector-specific pricing data so assumed uniform subsidy rates across industrial sectors.

Estimated energy use in polymerisation processes

- Energy consumption by polymer type and fuel source (electricity, NG, oil) obtained from literature (GJ/tonne of polymer produced).
- Combined with polymer production volumes (OECD & Polyglobe) to estimate total energy use by country and polymer.

Estimated energy use in monomer production processes

- Energy consumption by monomer production method and fuel type obtained from literature (GJ/tonne of polymer produced).
- Polymer production volumes converted to monomer using literature-based monomer-to-polymer conversion rates.
- Then combined with energy consumption rates to estimate total energy use by country and polymer.

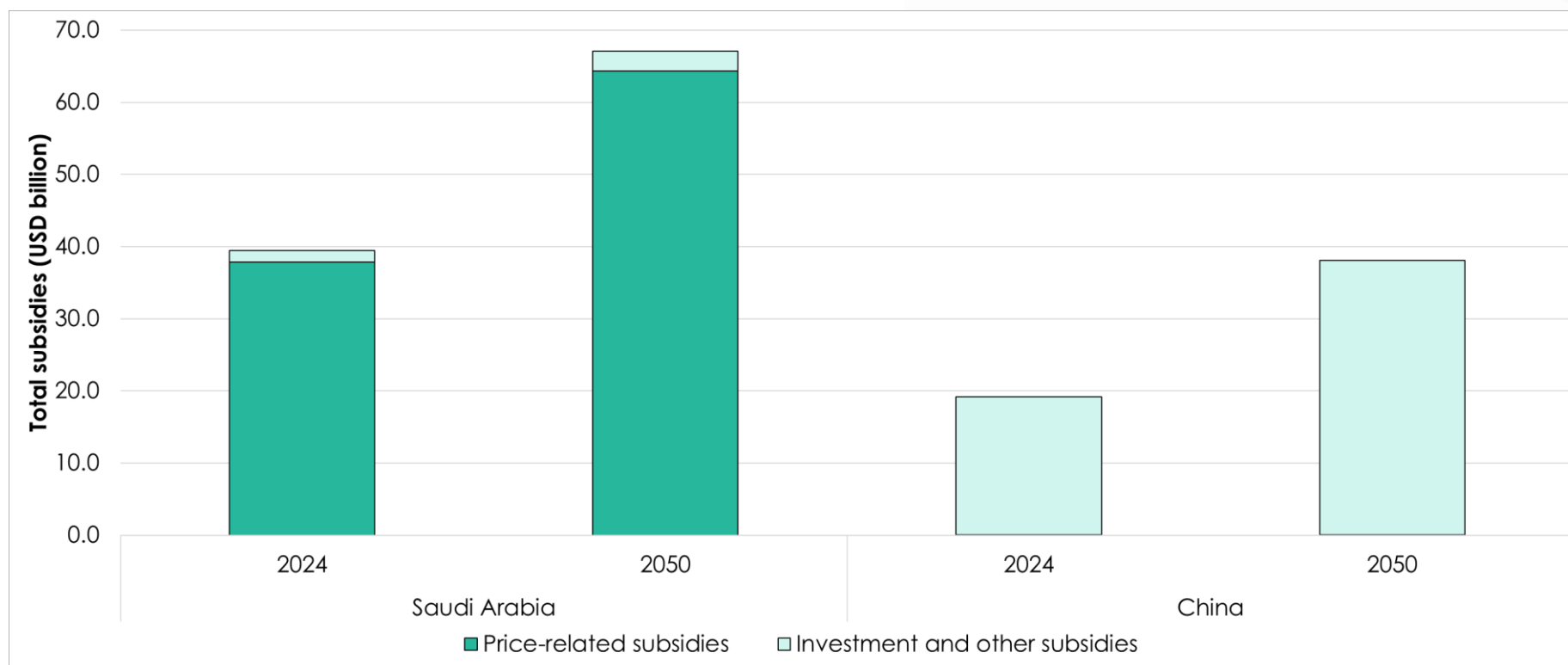
Calculated energy subsidy amount by country

- Level of subsidisation by country and polymer calculated by combining:
 - Total energy consumption by source, polymer, and country
 - IMF subsidy rates
- Same approach used for both polymerisation and monomer production energy subsidies.

Note: electricity subsidy rates from the IMF database reflect discounts in the sale price of electricity to industry compared to the cost of supply. No distinction may be made about the source of this electricity.

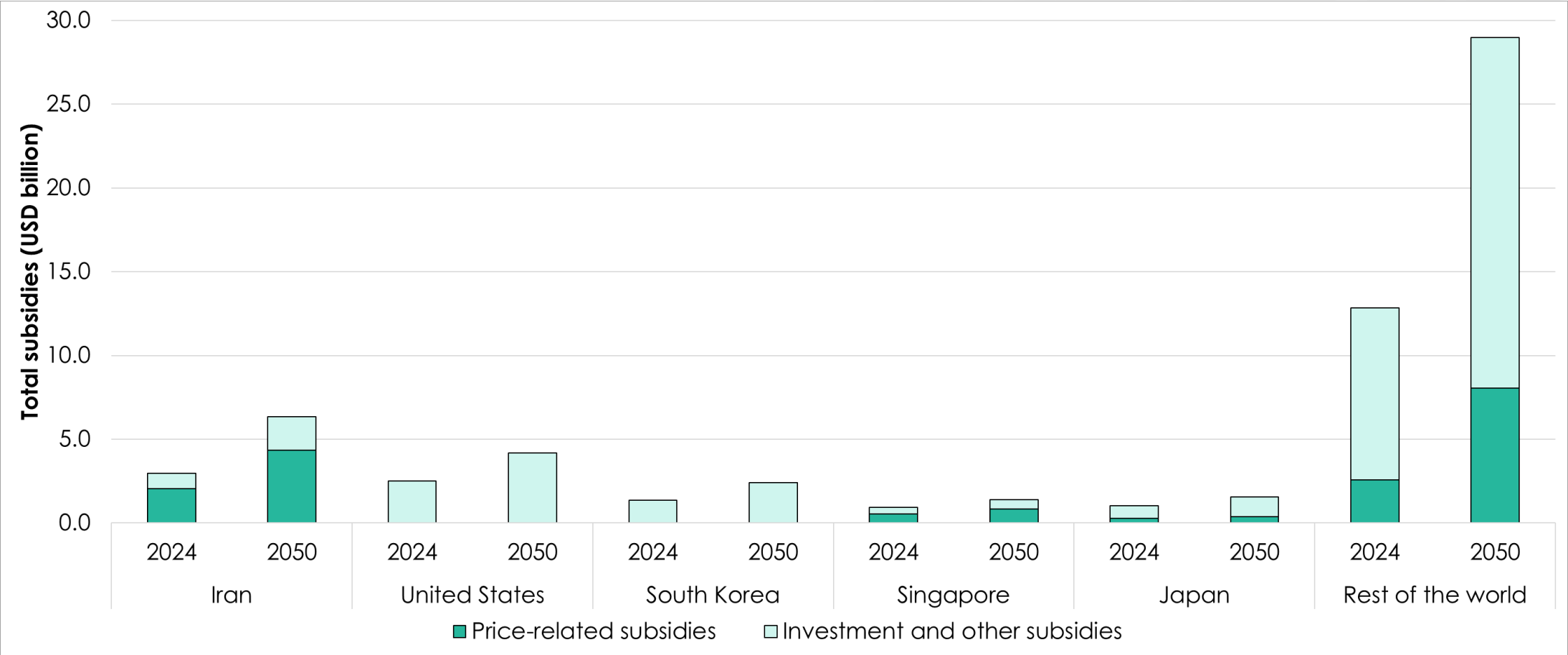
Results: baseline total PPP subsidies

- Total global PPP subsidies are estimated at **US\$ 80 billion in 2024**, rising to **US\$ 150 billion in 2050**
- Out of that **US\$ 43 billion** is price-related and **US\$ 37 billion** is investment and other subsidies
- Saudi Arabia and China account for approximately **75%**



Results: baseline total PPP subsidies (continued)

- Among others, **Iran** and the **United States** account for the next highest amounts of PPP subsidies



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Study caveats & next steps

Caveats

- For price-related subsidies, subsidy rates were estimated using averages for all industry, so they are not specific to polymer industry.
- For investment and other subsidies, where possible, data were collected through:
 - Plant and company-level research
 - Country-level research
 - International public databases
- There are large data gaps in plant and company-level research, and country-level research, so various assumptions were made to address these gaps

Next steps

- Improve the estimates for investment and other subsidies through additional country specific research
- Model additional scenarios:
 - Removal of specific types of subsidies
 - Partial removal of subsidies
- Model key environmental impacts (e.g. mismanaged plastic waste, plastic pollution).
- Model health impacts of subsidies removal
- Examine possible relationships between the level of PPP subsidies and polymer prices.