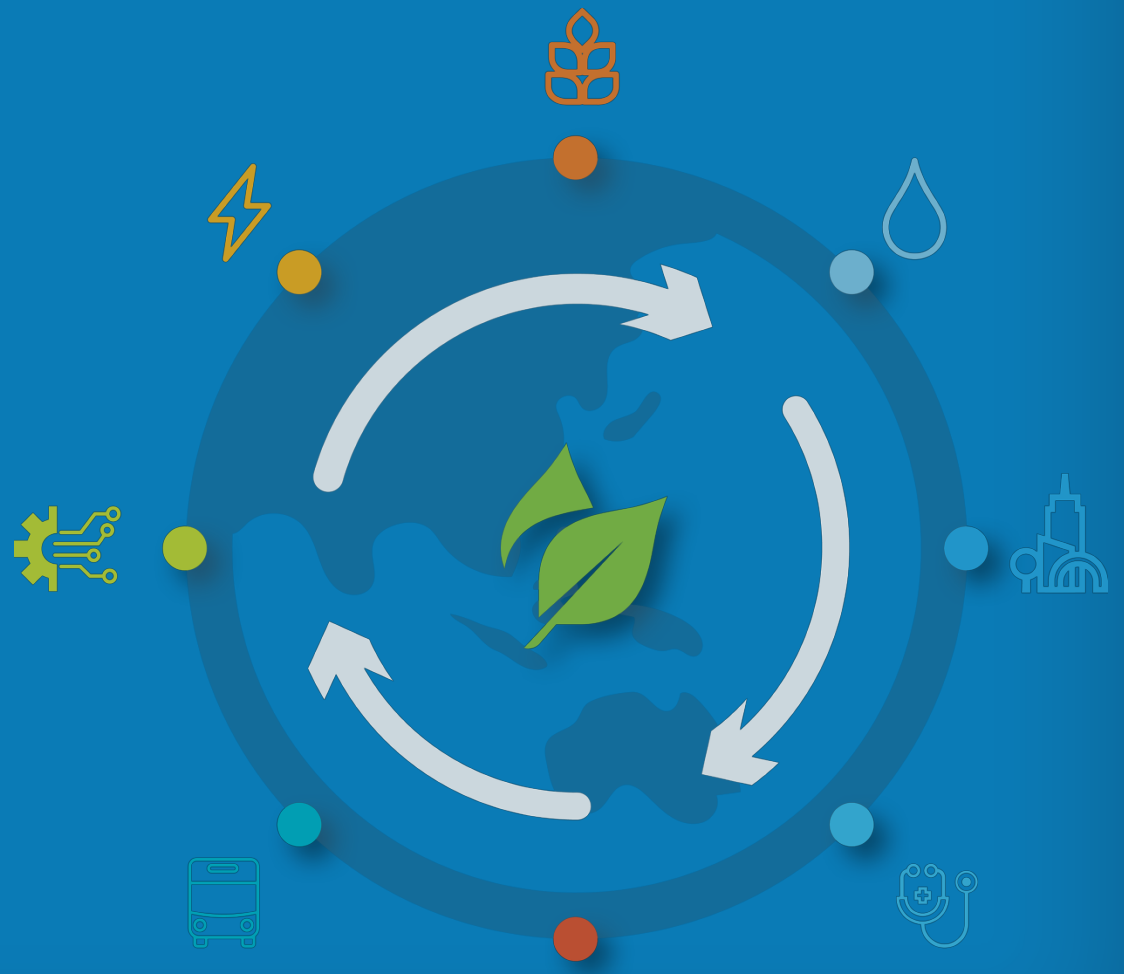
Preventing Marine Plastic Pollution through Packaging Circularity in Thailand: Recommendations on Economic Instruments



PROMOTING ACTION ON PLASTICS POLLUTION FROM SOURCE TO SEA IN SOUTHEAST ASIA AND PACIFIC
SUBPROJECT 2: PRIORITIZING AND IMPLEMENTING ACTIONS TO REDUCE MARINE PLASTIC POLLUTION

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KEY POINTS

- Six potential economic instruments that can reduce plastic pollution in Thailand were studied: taxes on virgin plastics, tax incentives for recycling investment, green public procurement, single-use plastics levies, advanced recycling fees, and deposit-refund systems.
- The economic instruments differ in their effectiveness, efficiency, equity, and enforceability, and can be implemented to create synergistic effects.
- Governments can use economic instruments and regulations to accelerate plastic circularity and address plastic pollution.

How Thailand Can Apply Economic Instruments to Accelerate Plastic Packaging Circularity

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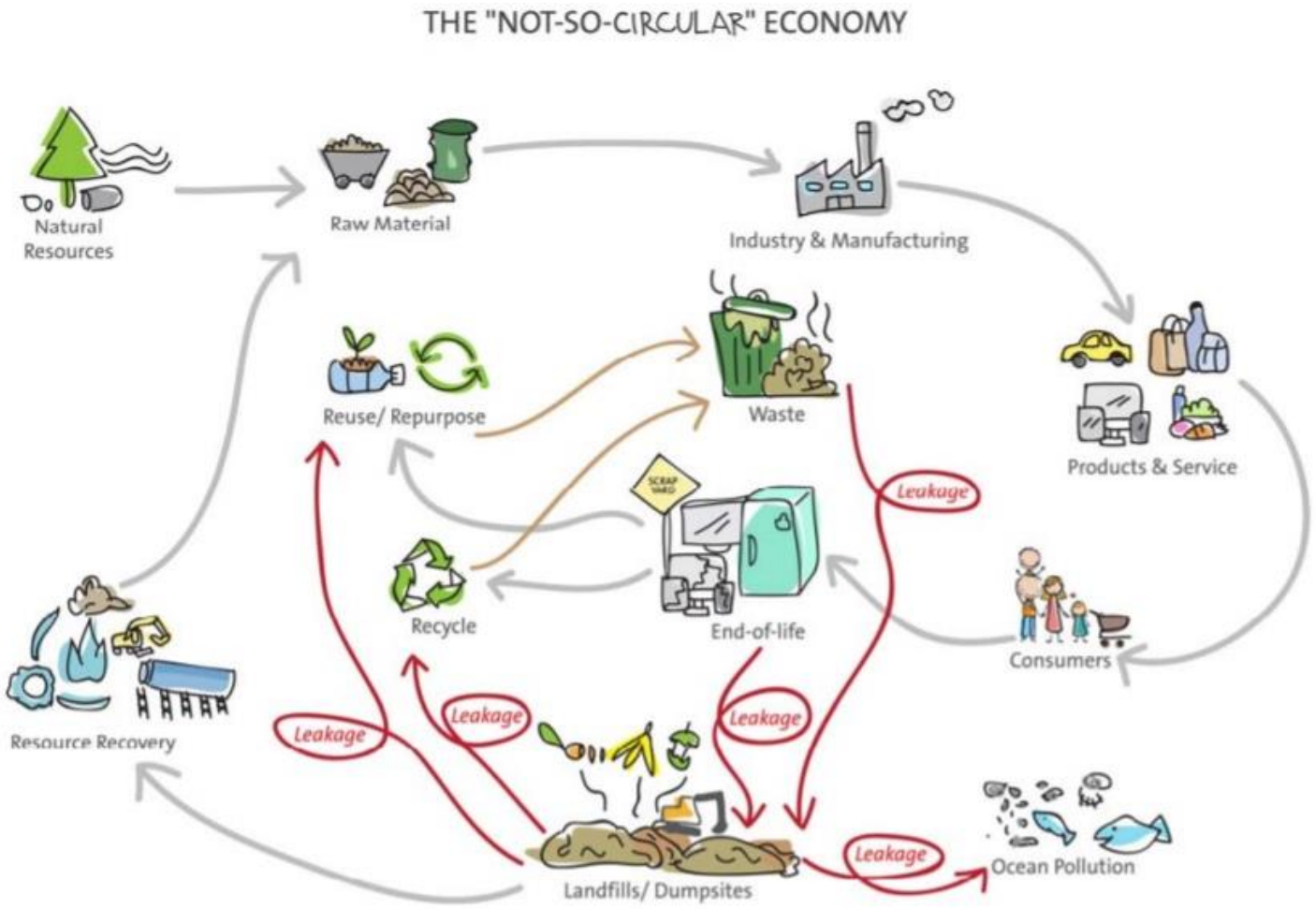
Policy Support – Assessment & Recommendations on Economic Instruments

- Intro & Background - Baseline Context on Plastic Packaging Management in Thailand
- Plastics value chain
- Establishing the Baseline Conditions
- Data Collection & Consultations with key informants
- Key Assumptions in the Model for Theory-based Evaluation
- The 4Es of Effectiveness, Efficiency, Enforceability & Equity
- Model Set-up and Baseline Scenario
- Results – Assessment of Outcomes of the Market Instruments
- Recommendations

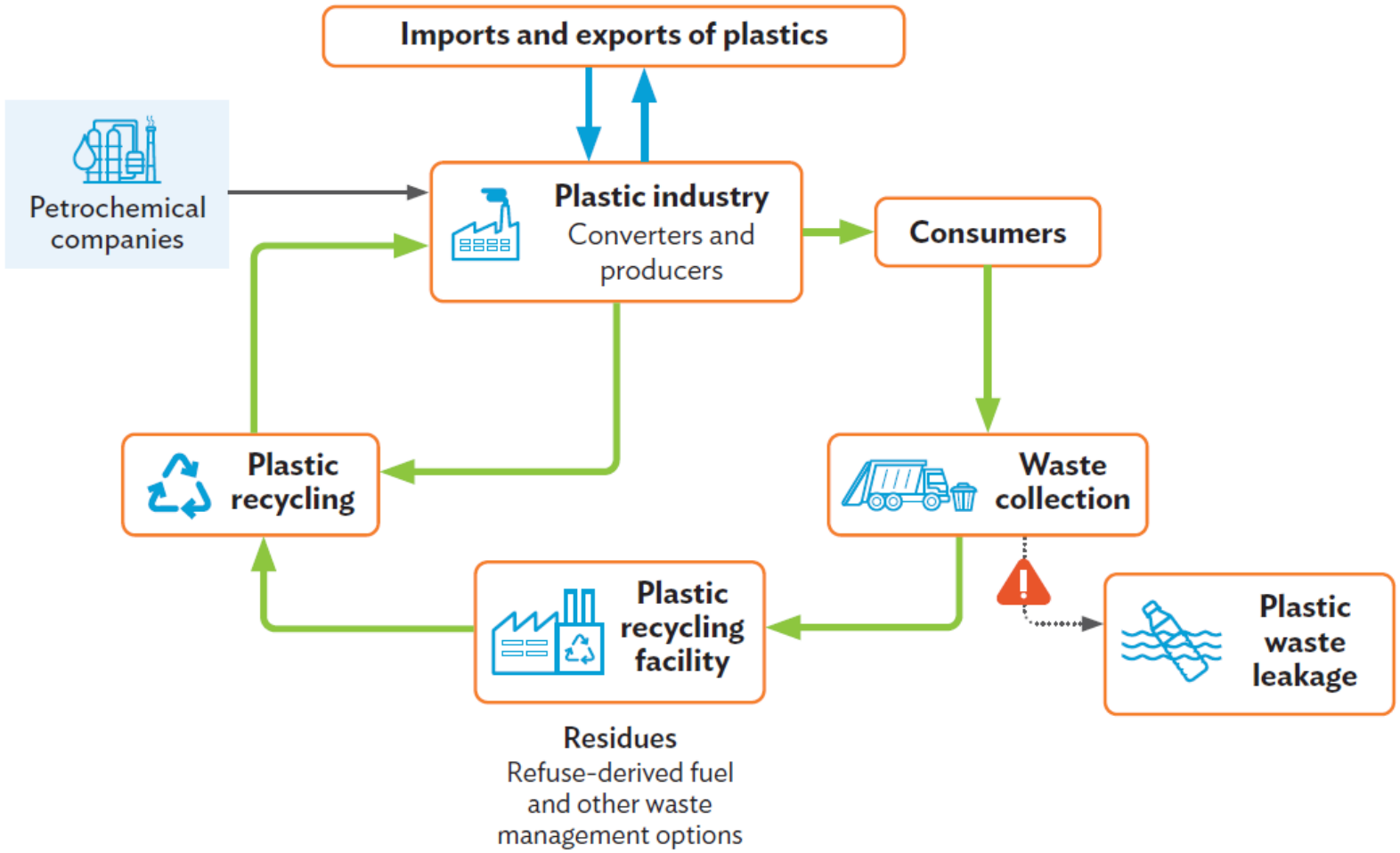


Source: Author

Baseline Context on Plastic Packaging Management in Thailand

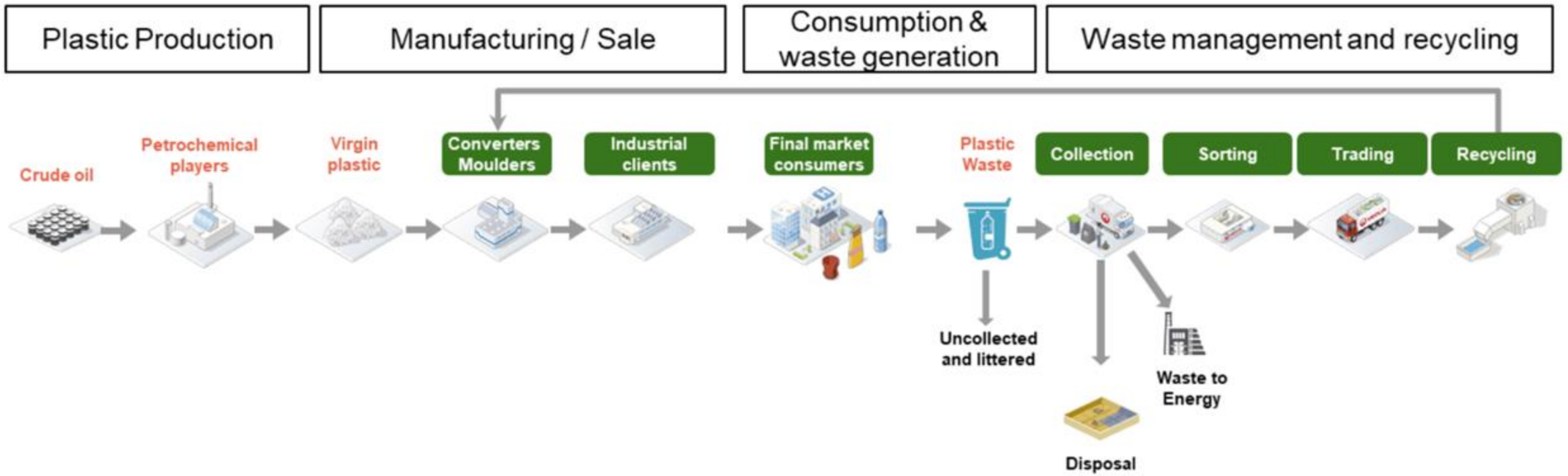
- Stakeholders mapping
- Institutional and Regulatory Framework review
- General Context and Market Assessment
- Plastic production and manufacturing
- Plastic waste Management (collection / recycling)
- Explore Challenges related to plastic packaging management in Thailand

Figure 1: Overview of the Plastic Value Chain



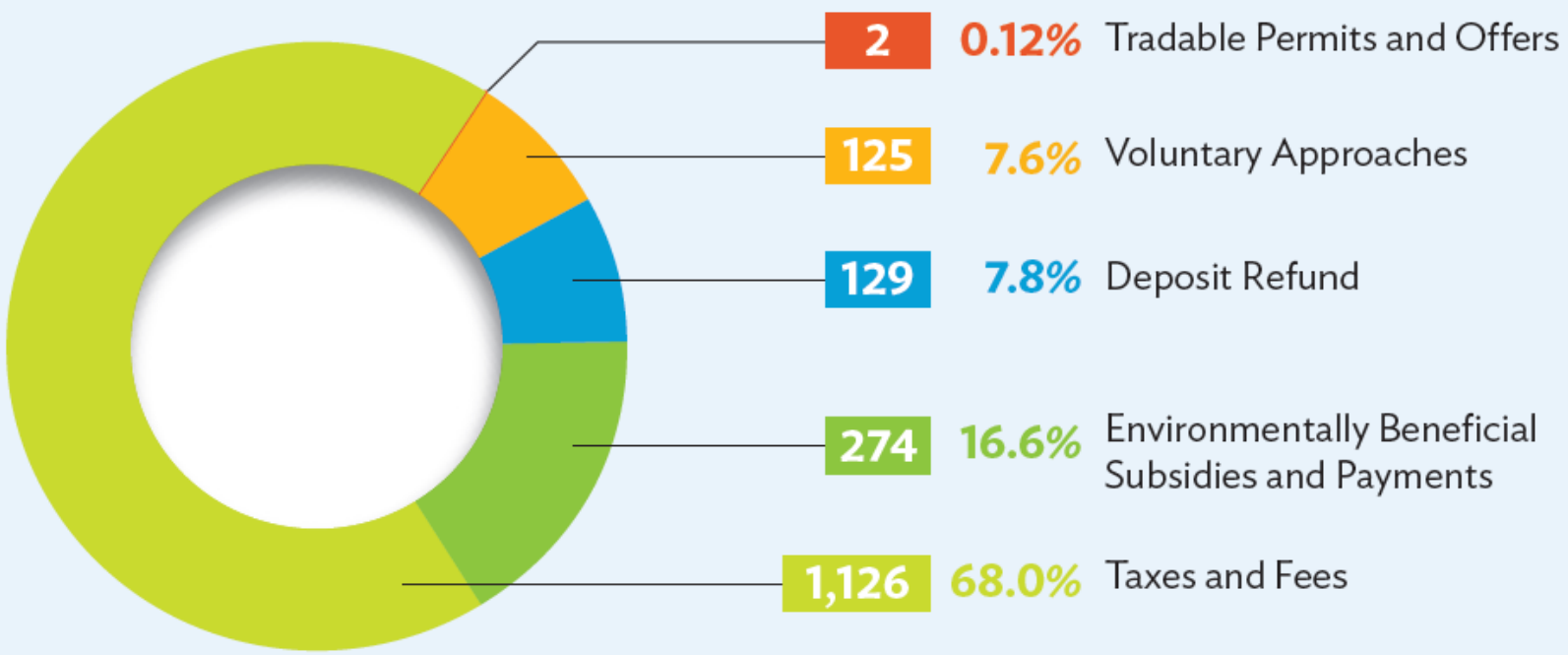
The Plastic Value Chain

The plastic material value chain refers to the entire lifecycle of plastics, encompassing the processes and business activities involved in the production, use, and disposal of plastic materials.



Policy Instruments In Solid Waste and Circular Economy Domains

Policy Instruments by Type in Solid Waste and Circular Economy Domains

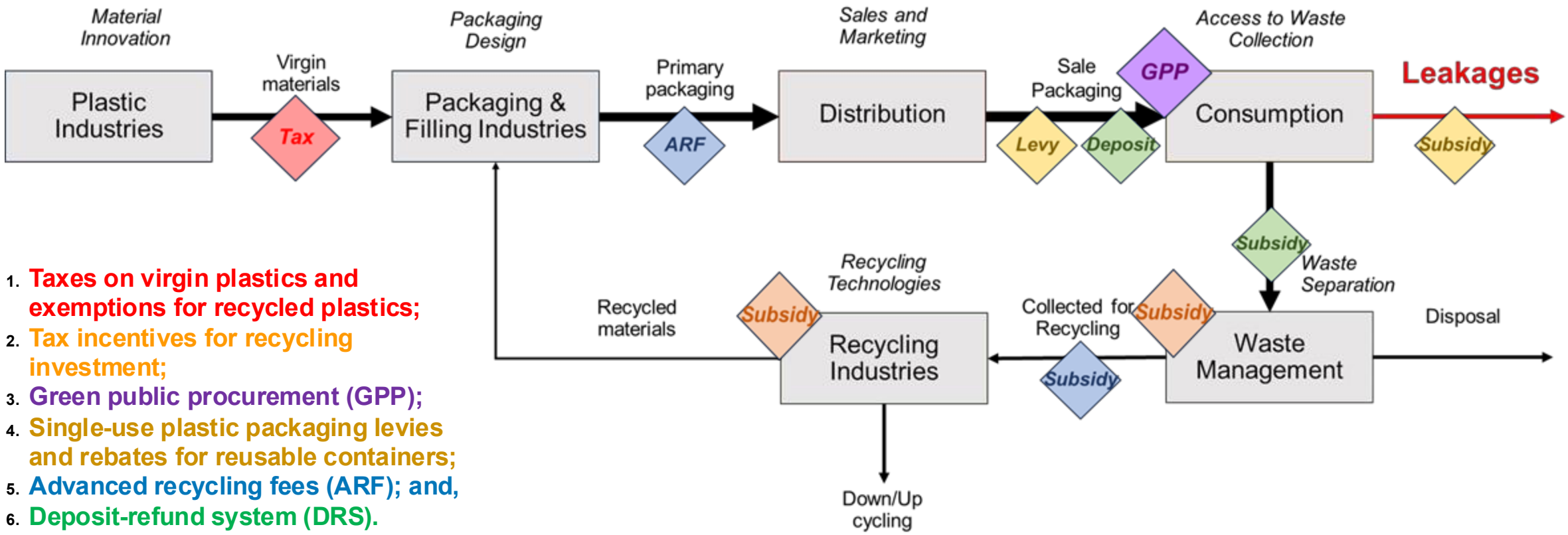


[a] OECD. Policy Instruments for the Environment (PINE) Database (accessed 10 December 2024).
[b] W.B. Habib. 2022. Cheaper Polythene Bags Spell Disaster for the Environment. *The Daily Star*. 15 June.
[c] Library of Congress. 2021. China: Single-Use Plastic Straw and Bag Ban Takes Effect. 23 March.
[d] I. Ara. 2022. This Is What a Radical Plastic Ban Looks Like. *Time*. 30 June.
[e] United Nations Environment Programme. 2021. Kenya Emerges as Leader in Fight Against Plastic Pollution. 18 February.

Source: OECD. 2024. Policy Instruments for the Environment (PINE) Database (accessed July 2024).

Targeted Economic Instruments in the Value Chain

Economic instruments: market-based approach to internalise environmental costs and benefits by offering incentives or disincentives to influence the behaviour of economic actors.



1. **Taxes on virgin plastics and exemptions for recycled plastics;**
2. **Tax incentives for recycling investment;**
3. **Green public procurement (GPP);**
4. **Single-use plastic packaging levies and rebates for reusable containers;**
5. **Advanced recycling fees (ARF); and,**
6. **Deposit-refund system (DRS).**

Assessment & Recommendations on Economic Instruments

Economic Instruments: Assessment on the 4Es

Pollution Control Department (PCD) Priorities with the Economic Instruments:

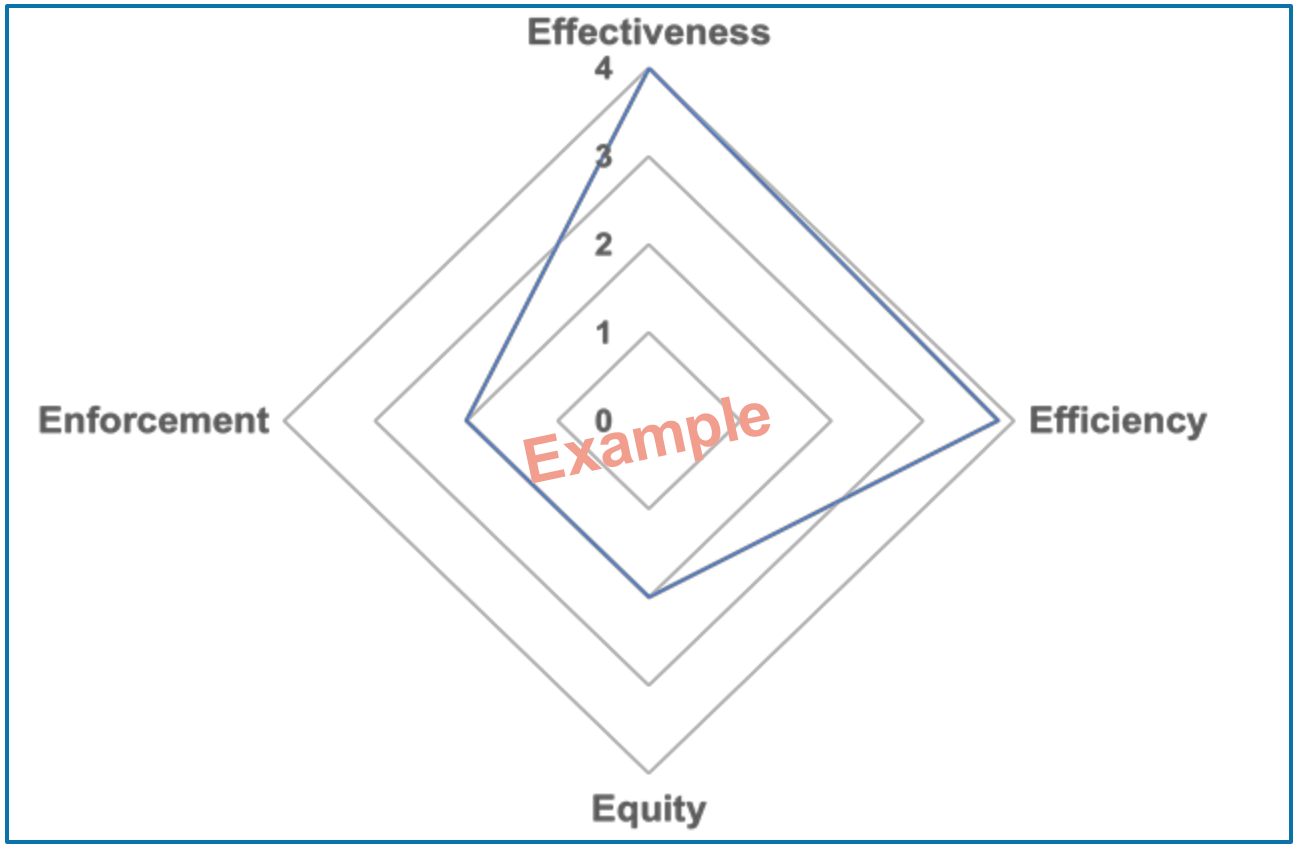
Economic valuation of selected economic instrument with the main focus on the environmental and financial impact and a secondary focus on social impact of the economic measures in regards to context of Thailand.

Effectiveness: Do the economic instrument lead to intended results, the reduction of marine plastic pollution?

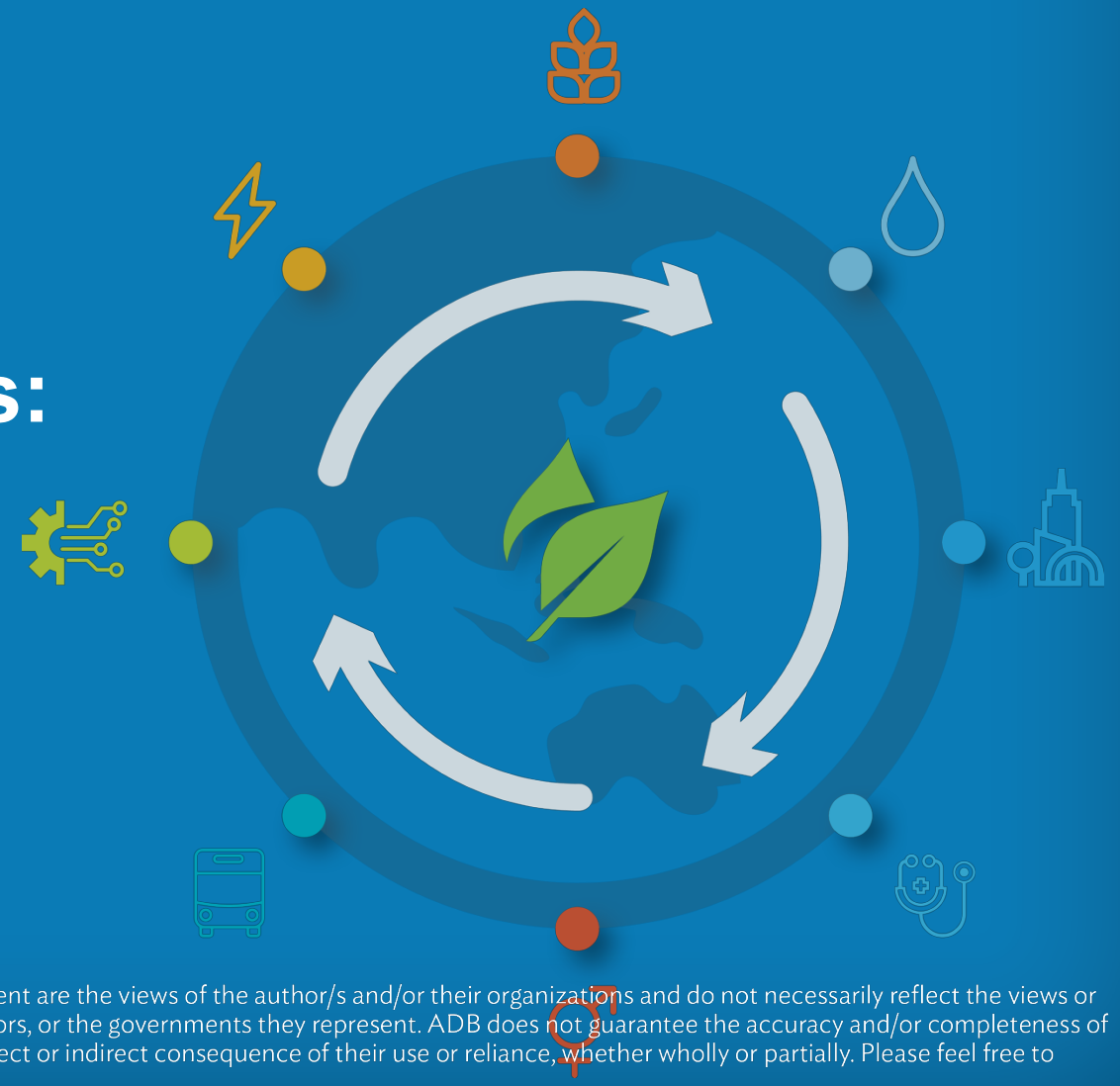
Efficiency: Are the resource allocation involved justified, given the changes and effects achieved?

Equity: Will the costs and benefits be equitably distributed?

Enforcement: Are the resources, regulations and authority to implementation within the capacity of the enforcement authority?



Modelling the Reduction of Marine Plastic Pollution through Economic Instruments: A Case Study of Thailand



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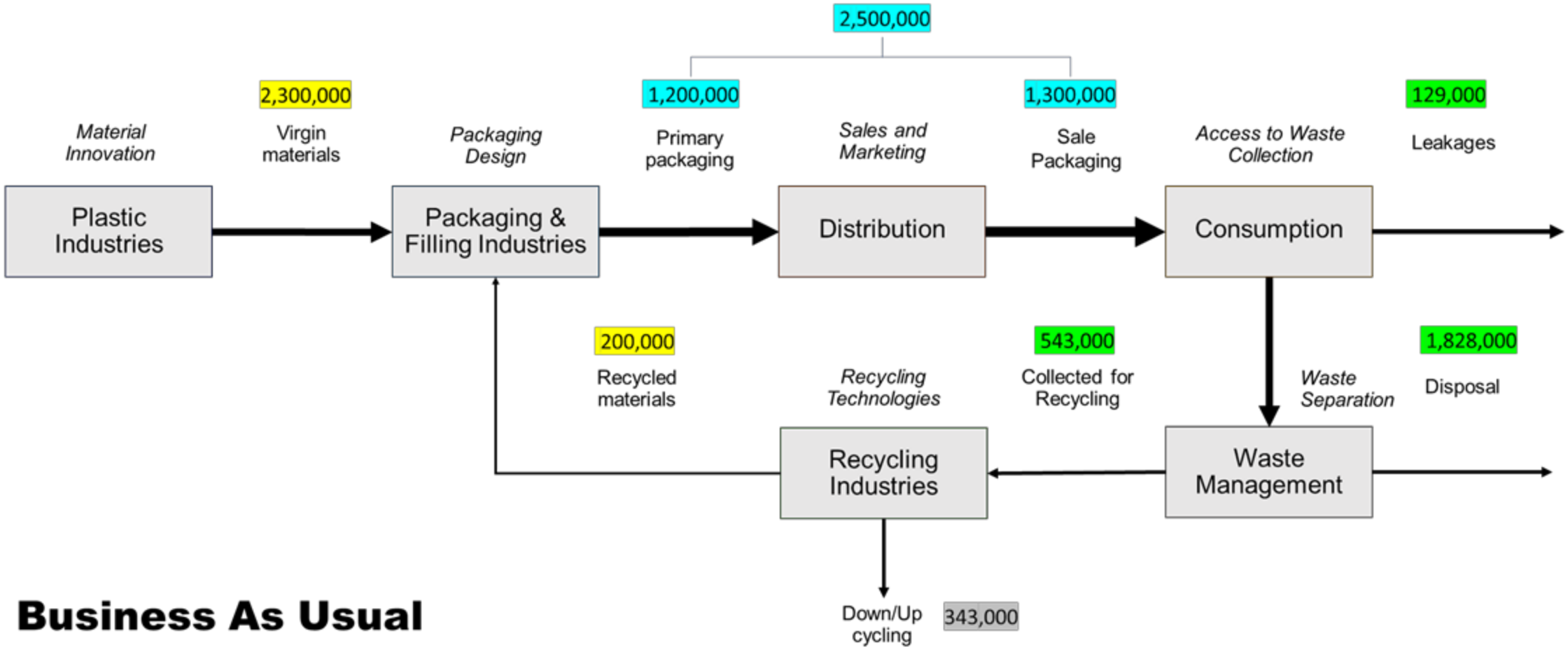
25/06/2025

Model Set-up and Baseline Scenario

Key Assumptions in the Model for Theory-based Evaluation (TBE)

Plastic Production	• Most of the plastic packaging is made of virgin resins. The most popular type is PE, followed by PP, PET, and PS, respectively. • Recycled resins are available for PET, PE, and to a limited extent PP (mostly downcycled).
Manufacturing/ Sale	• Plastics are converted into different forms of packaging and SUPs. The top 3 applications (>80%) are monolayer bags (e.g. carrying bags), multilayer pouches (e.g. snack bags) and bottles. • The split between primary packaging vs sale packaging is almost 50:50.
Consumption/ Waste Generation	• Most applications are short-lived and the model assumes no lag between consumption and waste generation, i.e. total inputs = total outputs with no change in stock at a system level. • About 30% of local governments do not provide basic waste removal services.
Waste Management & Recycling	• The main pathway of marine plastic pollution is from the areas with mismanagement, i.e. localities where people throw away their own waste and to lesser extent improper disposal sites. • Most of plastic scraps are downcycled into other applications. But closed-loop recycling is gaining more ground after the FDA lifted the ban on food-contact packaging.

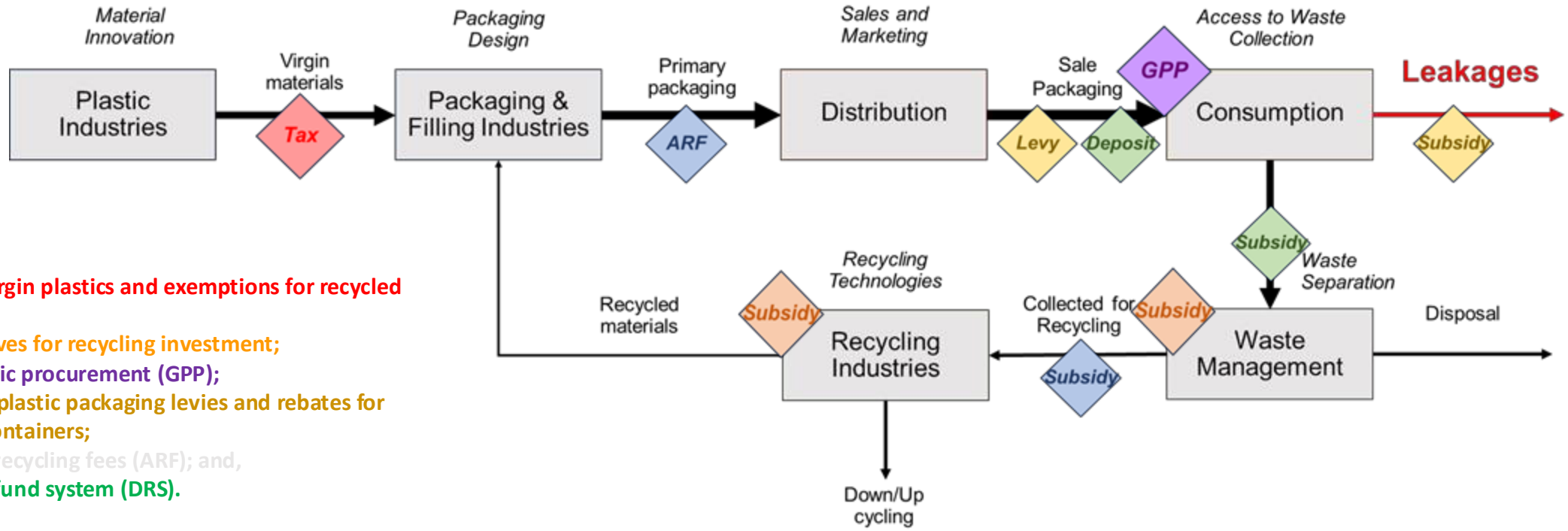
Baseline: The Business-as-usual (BAU) Scenario



SCOPE : The Shortlisted Economic Instruments

An economic instrument is a market-based approach to internalise environmental costs and benefits by offering incentives or disincentives to influence the behaviour of an economic actors. There were 6 sets of economic instruments included in this study.

The points of intervention of the 6 economic instruments



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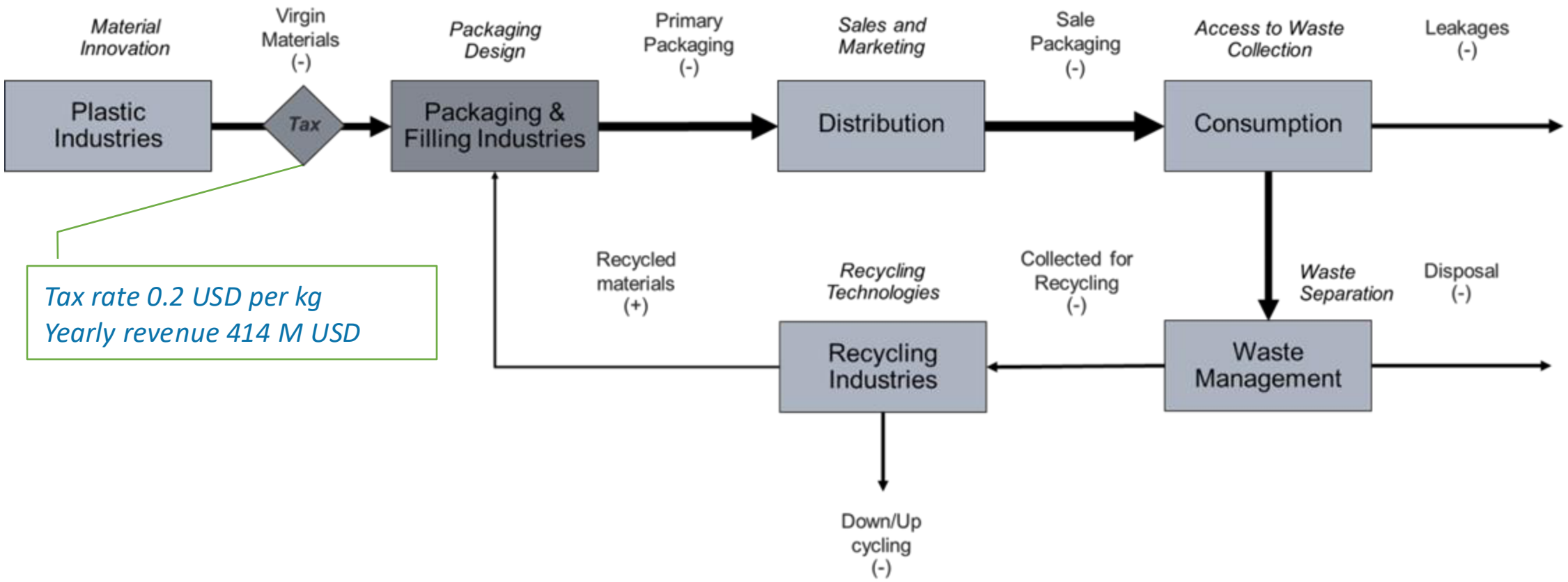
Key Results

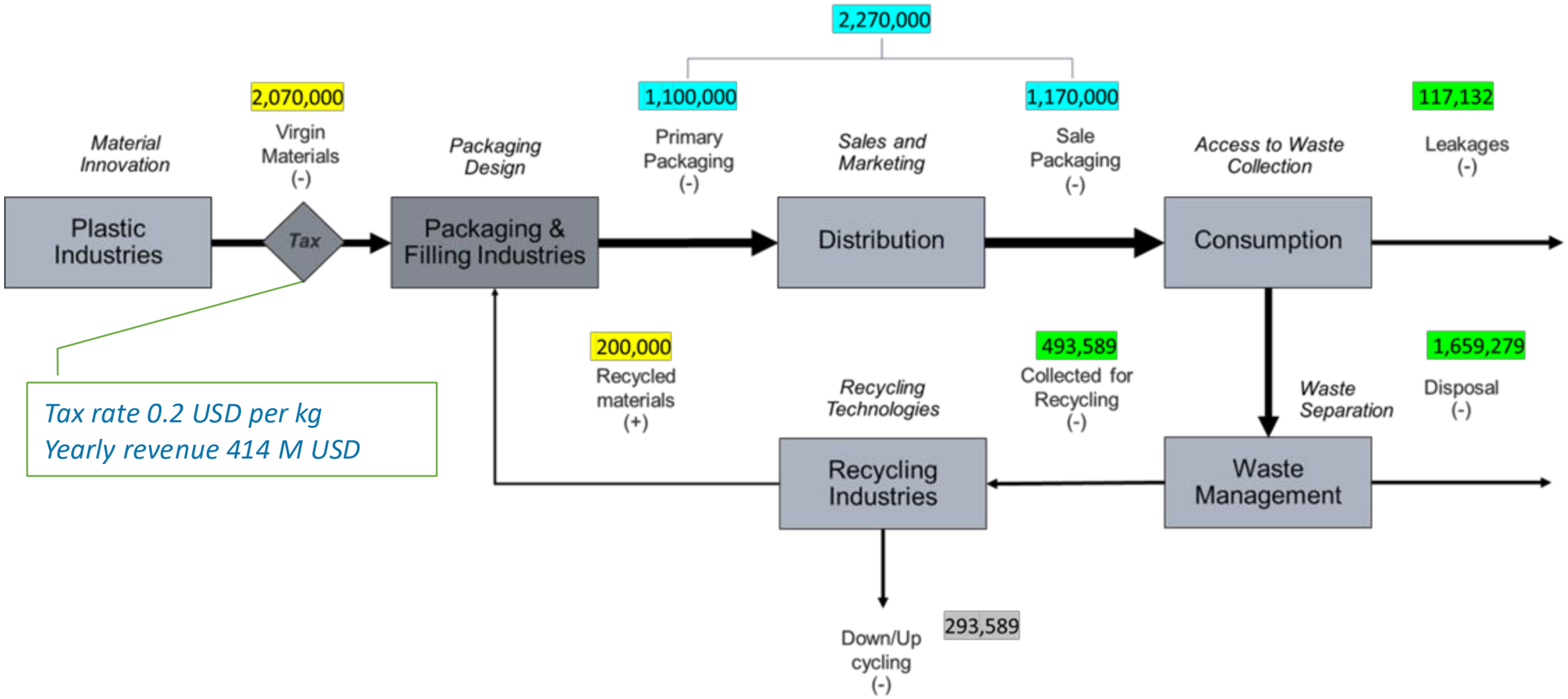
Taxes on virgin plastics and exemptions for recycled plastics

Key assumptions in the implementation theory	References
1) An excise tax is imposed on virgin plastics at the rate of 0.2 USD per kg	International benchmarking
2) A 10% decrease in virgin plastics used for packaging and SUPs	Qualitative interviews
3) The tax revenues of 414 million USD per year are not earmarked	1) X 2)
4) Recycled plastics are not taxable and the volume remains the same	Qualitative interviews

Taxes on virgin plastics and exemptions for recycled plastics



Taxes on virgin plastics and exemptions for recycled plastics



Taxes on virgin plastics and exemptions for recycled plastics

Advantages: Addresses the upstream, revenue raising ability

Disadvantages: Long chain of effects on the pollution, political willingness to tax at a high rate

Tax rate 0.2 USD per kg
Yearly revenue 414 M USD

Avoided impact:

- 11,868 tonnes at a required cost of 34,884 USD per tonne.
- Equally affected all packaging with virgin plastics.
- Can be introduced under the existing laws

Tax incentives for recycling investment

Advantages: Already available, target critical elements in the recycling industries

Disadvantages: Little effect on the inputs of plastics, contentious issue over exports

CIT exemptions to critical techs
Lost revenue 40 M USD

Avoided impact:

- 5,000 tonnes at a required cost of 7,920 USD per tonne
- Limited access to SMEs due to strict conditions
- Already available under the existing laws

Green public procurement (GPP)

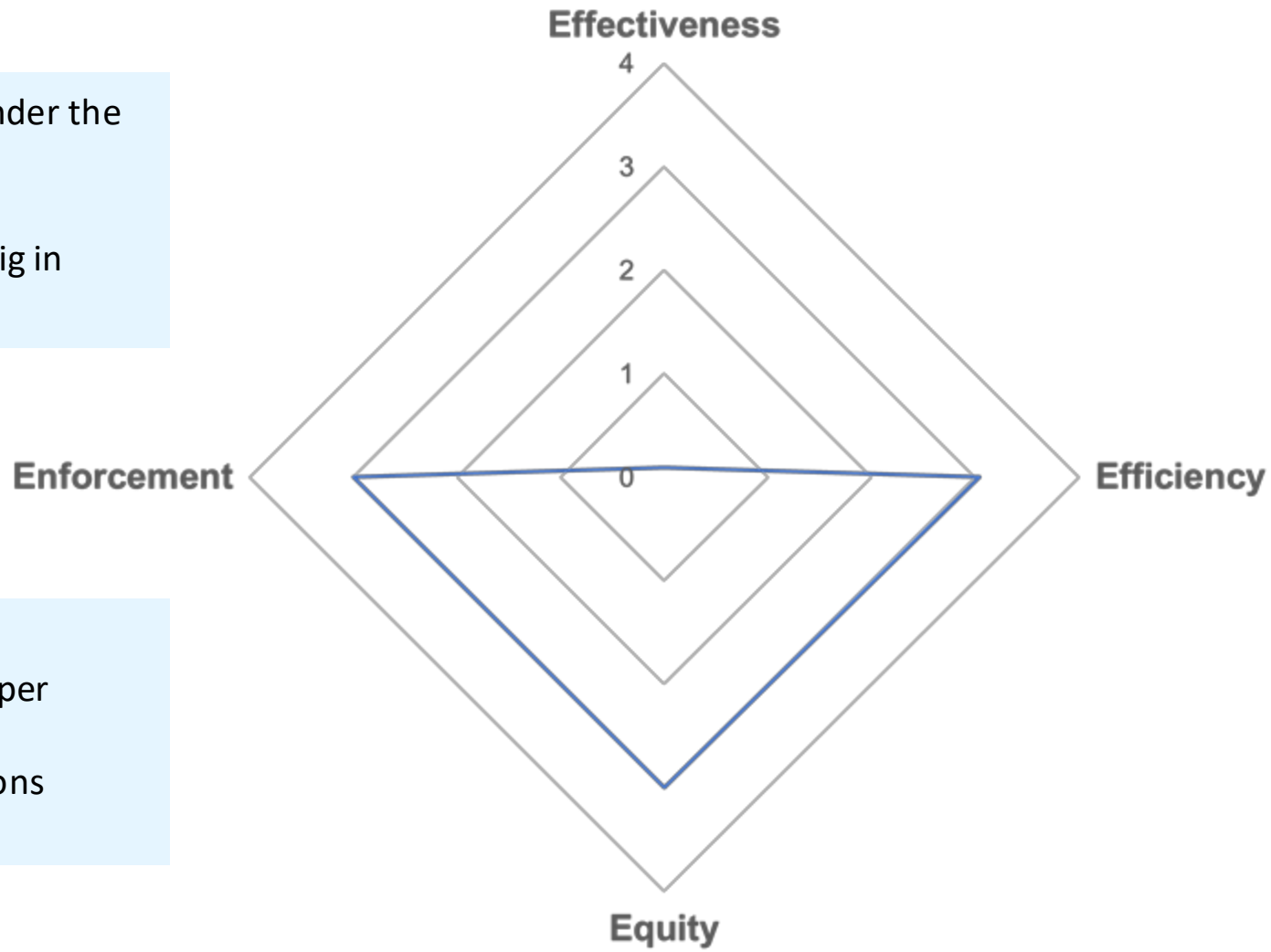
Advantages: can be added as a new consideration under the existing framework

Disadvantages: the government's share is not that big in these sectors

Premium price 0.3 USD per kg
Additional budget 30 M USD

Avoided impact:

- 1,290 tonnes at a required cost of 23,256 USD per tonne
- Limited access to SMEs without special provisions
- Can be introduced under the existing laws



Single-use plastic packaging levies (and rebates for reusable containers)

Advantages: two-part instrument, address hotspot applications (e.g. monolayer bags)

Disadvantages: difficult to enforce with micro and small vendors (alternative on wholesalers?)

Levy 0.7-1 THB per SUP
Fund 185 M USD

Avoided impact:

- 37,719 tonnes at a required cost of 4,901 USD per tonne
- Difficult to be implemented on small vendors
- Need a new legal framework

Advanced recycling fees (ARF)

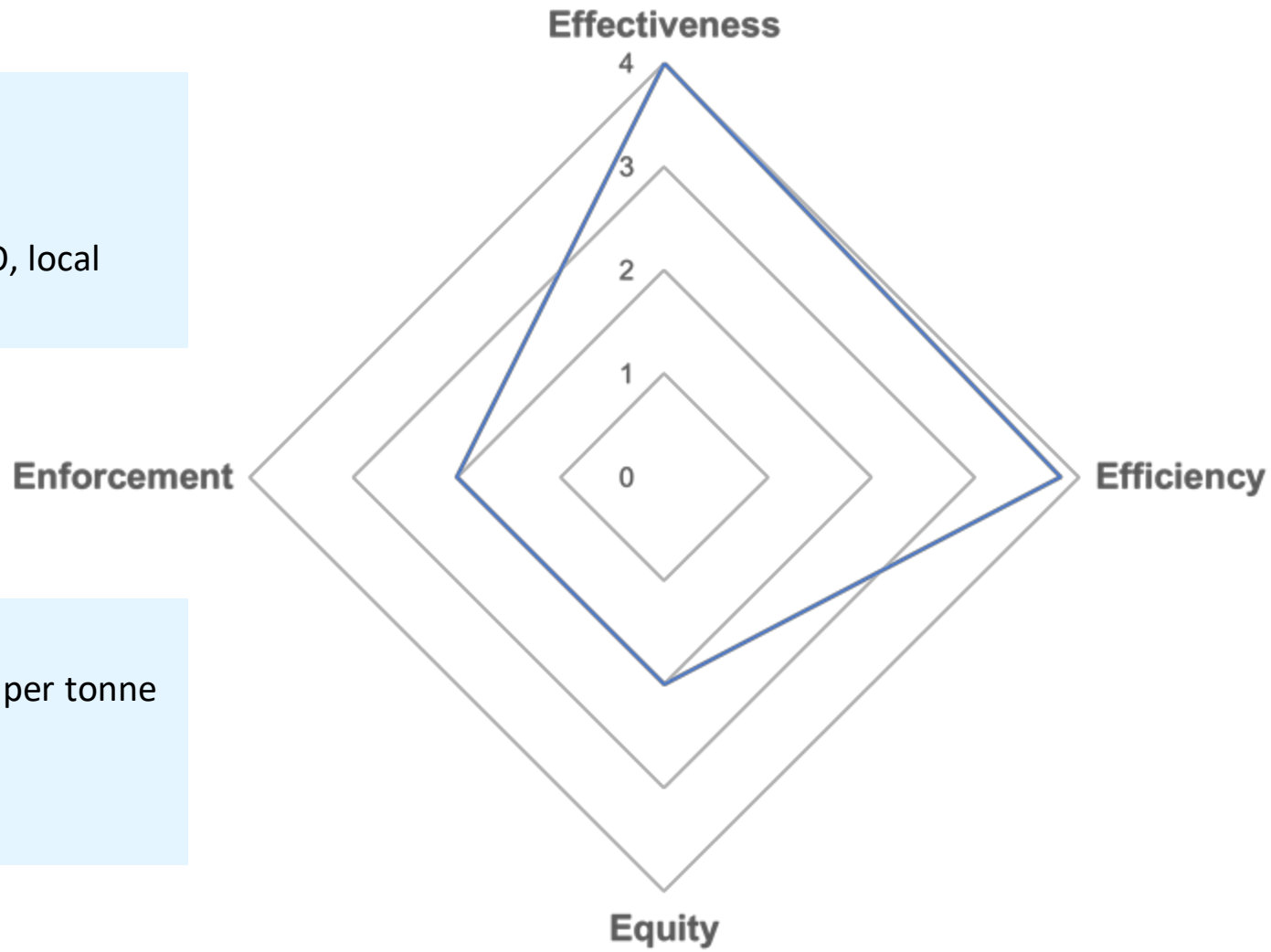
Advantages: two-part instrument, address hotspot applications (e.g. multilayer pouches)

Disadvantages: need coordination between the PRO, local governments and contractors

ARFs 0.1-1 USD per kg
Fund 239 M USD

Avoided impact:

- 56,498 tonnes at a required cost of 4,221 USD per tonne
- Required special provisions for SMEs
- Need a new legal framework



Deposit-refund system (DRS)

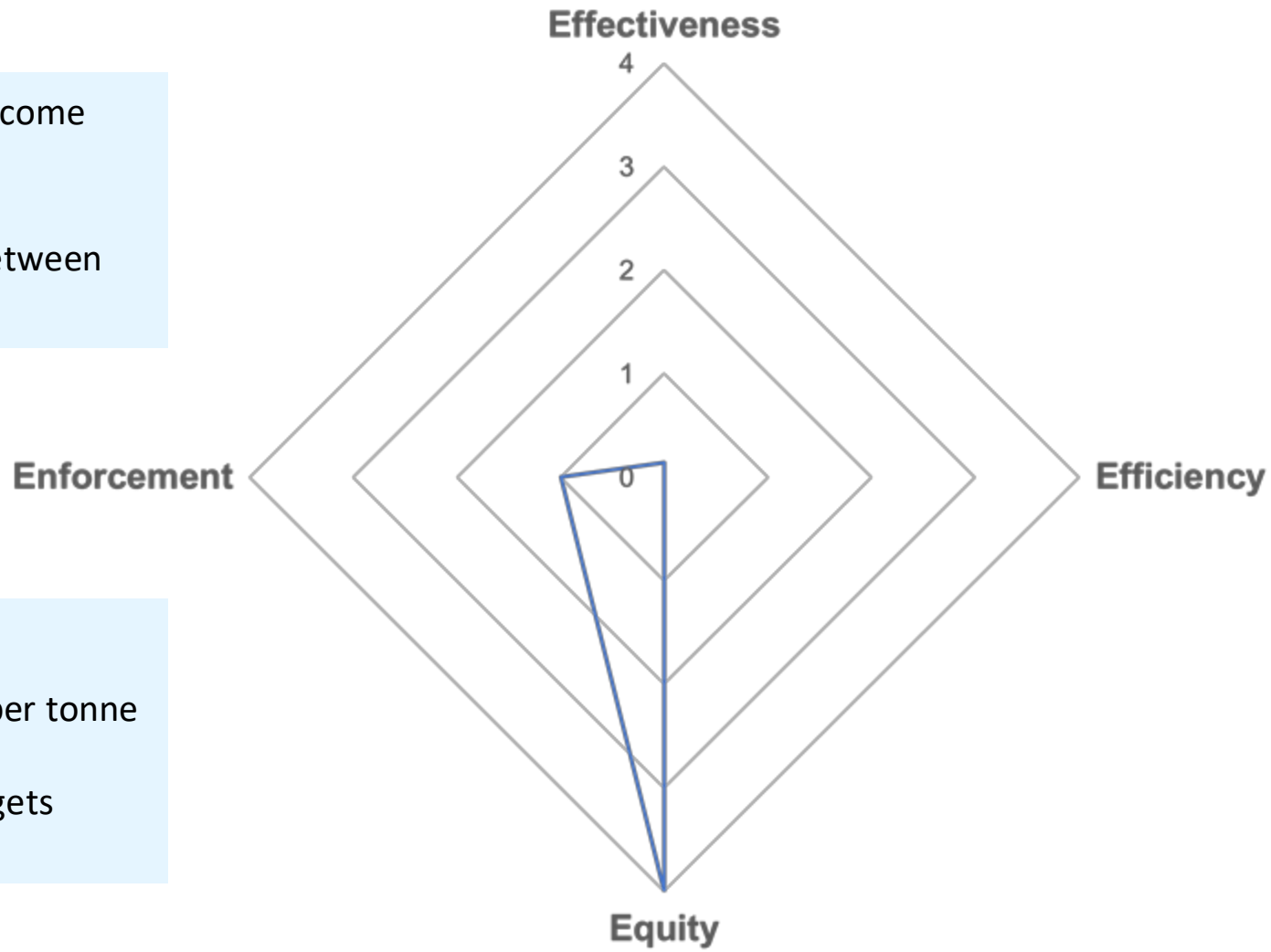
Advantages: redistribution effects that benefit low-income households and waste pickers

Disadvantages: not address the hotspot, trade-off between high investment and convenience

Deposit 1.5-2 THB per bottle
Fund 197 M USD

Avoided impact:

- 2,024 tonnes at a required cost of 97,317 USD per tonne
- Benefits low-income and waste pickers
- Need a new legal framework and ambitious targets



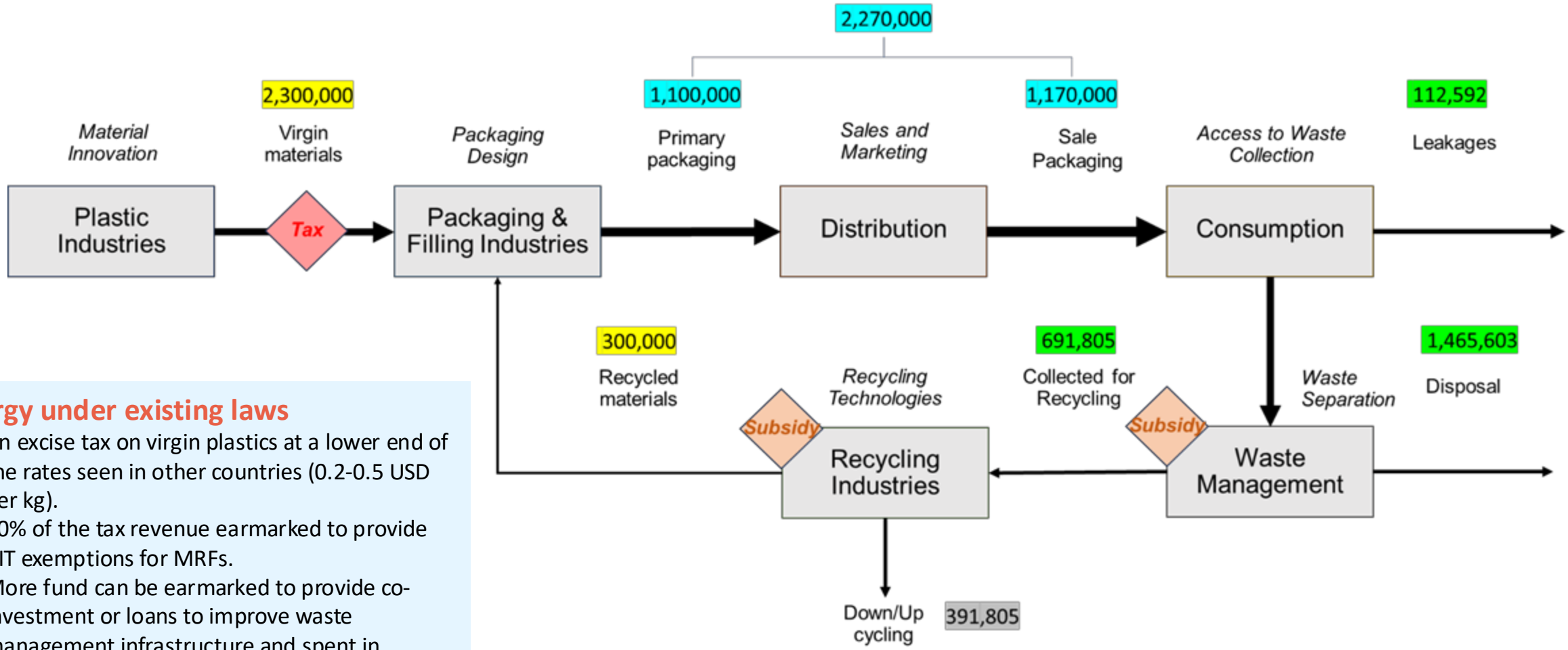
Comparison of the Economic Instruments

Economic Instrument	Effectiveness[a]	Efficiency[b]	Equity	Enforcement
1. Tax on virgin plastics and exemption for recycled plastics	Medium	Medium	Medium	Could be implemented under existing laws
2. Tax incentive for recycling investment	Medium	Good	Poor	
3. Green public procurement	Poor	Medium	Medium	
4. Single-use plastic packaging levy and rebate for reusable containers	Good	Good	Poor	Would require a new legal framework
5. Advanced recycling fee	Good	Good	Medium	
6. Deposit-refund system	Poor	Poor	Good	

[a] Measured in terms of estimated reduction of pollution (in tons/year).
[b] Measured by the value of resource allocation required per unit of change (in $/ton).
Source: Authors.

Policy Recommendation

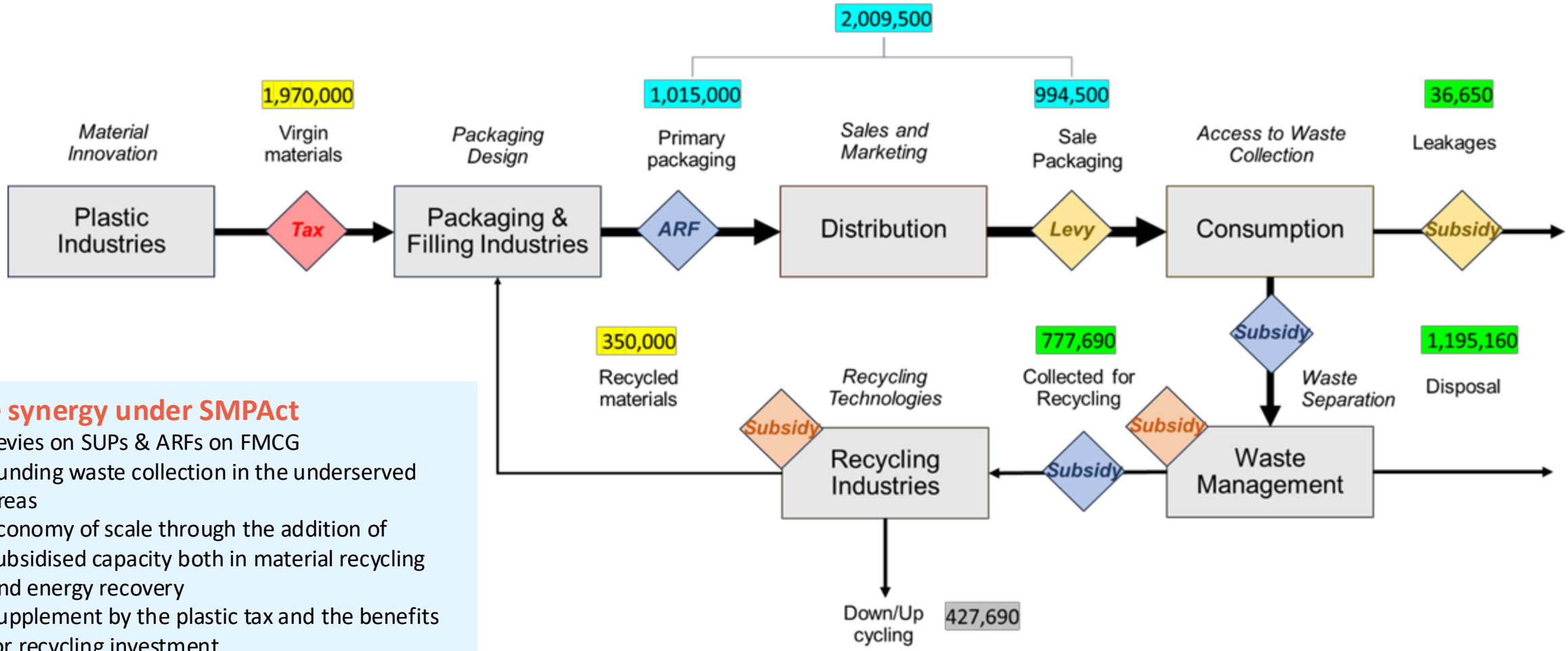
Recommended short-term policy mix and estimated effects



Synergy under existing laws

- An excise tax on virgin plastics at a lower end of the rates seen in other countries (0.2-0.5 USD per kg).
- 10% of the tax revenue earmarked to provide CIT exemptions for MRFs.
- More fund can be earmarked to provide co-investment or loans to improve waste management infrastructure and spent in awareness campaigns.

Recommended mid-term policy mix and estimated effects



More synergy under SMPAct

- Levies on SUPs & ARFs on FMCG
- Funding waste collection in the underserved areas
- Economy of scale through the addition of subsidised capacity both in material recycling and energy recovery
- Supplement by the plastic tax and the benefits for recycling investment

Conclusions and Final Remarks

- Economic instruments offer a market-based approach to addressing plastic pollution by allowing economic actors to make the decisions that reflect their different abatement costs.
- The Thai Government can introduce an excise tax on virgin plastics and earmark part of the revenues to support recycling technologies and improve waste infrastructure in a short run.
- However, to effectively reduce marine plastic pollution, the enactment of the SMPAct is vital as it will unlock the potential of stronger instruments such as levies on SUPs and the introduction of ARFs via an EPR programme.
- GPP and DRS may be added for specific cases, such as in sensitive areas like islands but are not recommended for a wider application.
- The *ex post* assessment of any instrument should consider the execution and economic aspects of its implementation.

Thanks for your attention