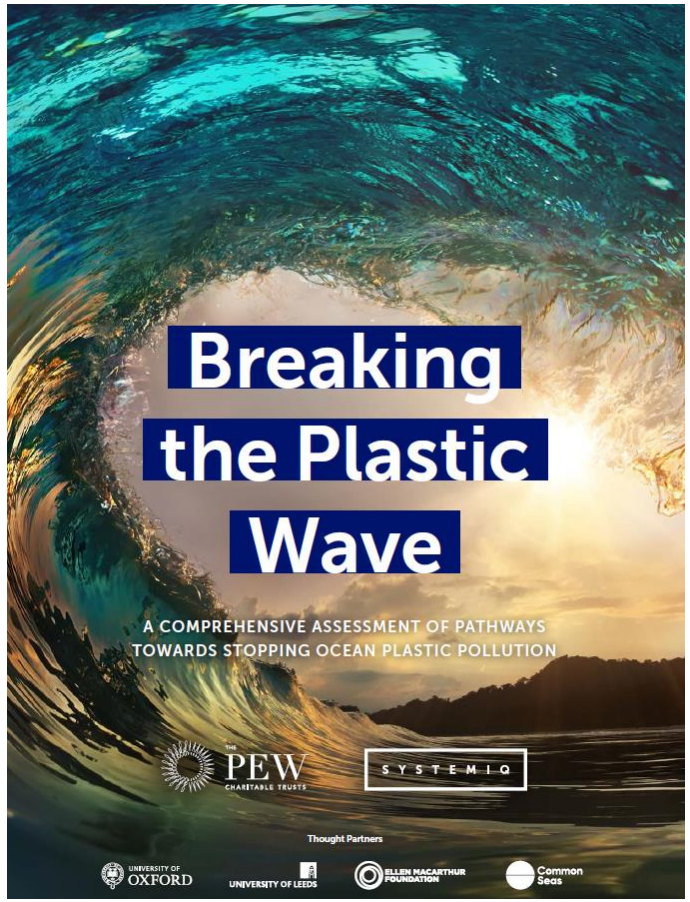
Modeling plastic systems in Fiji and the Pacific using Pathways

Presentation for the UNCTAD-UNDP Fiji National Symposium on Plastic Pollution Prevention

October 16-18, 2024

Pew

Breaking the Plastic Wave



SYSTEMIQ

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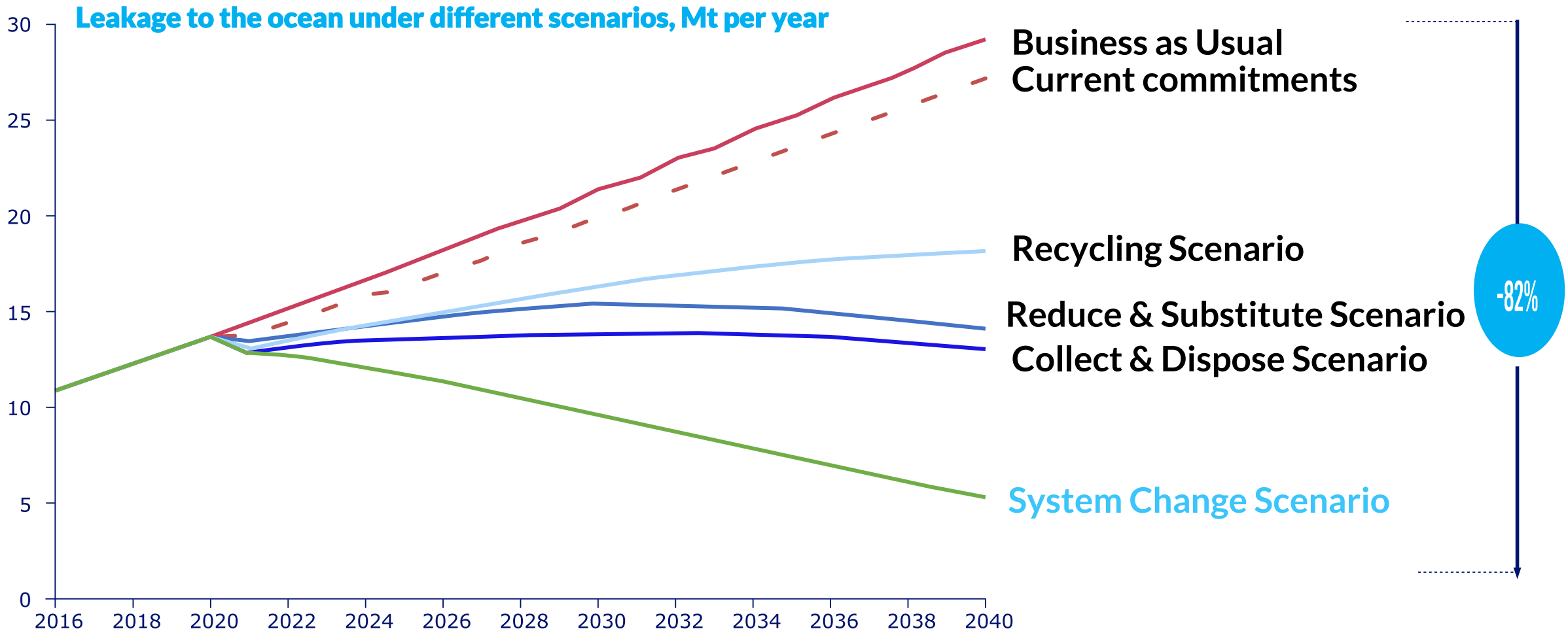
Common Seas

No “silver bullets”, but there is hope



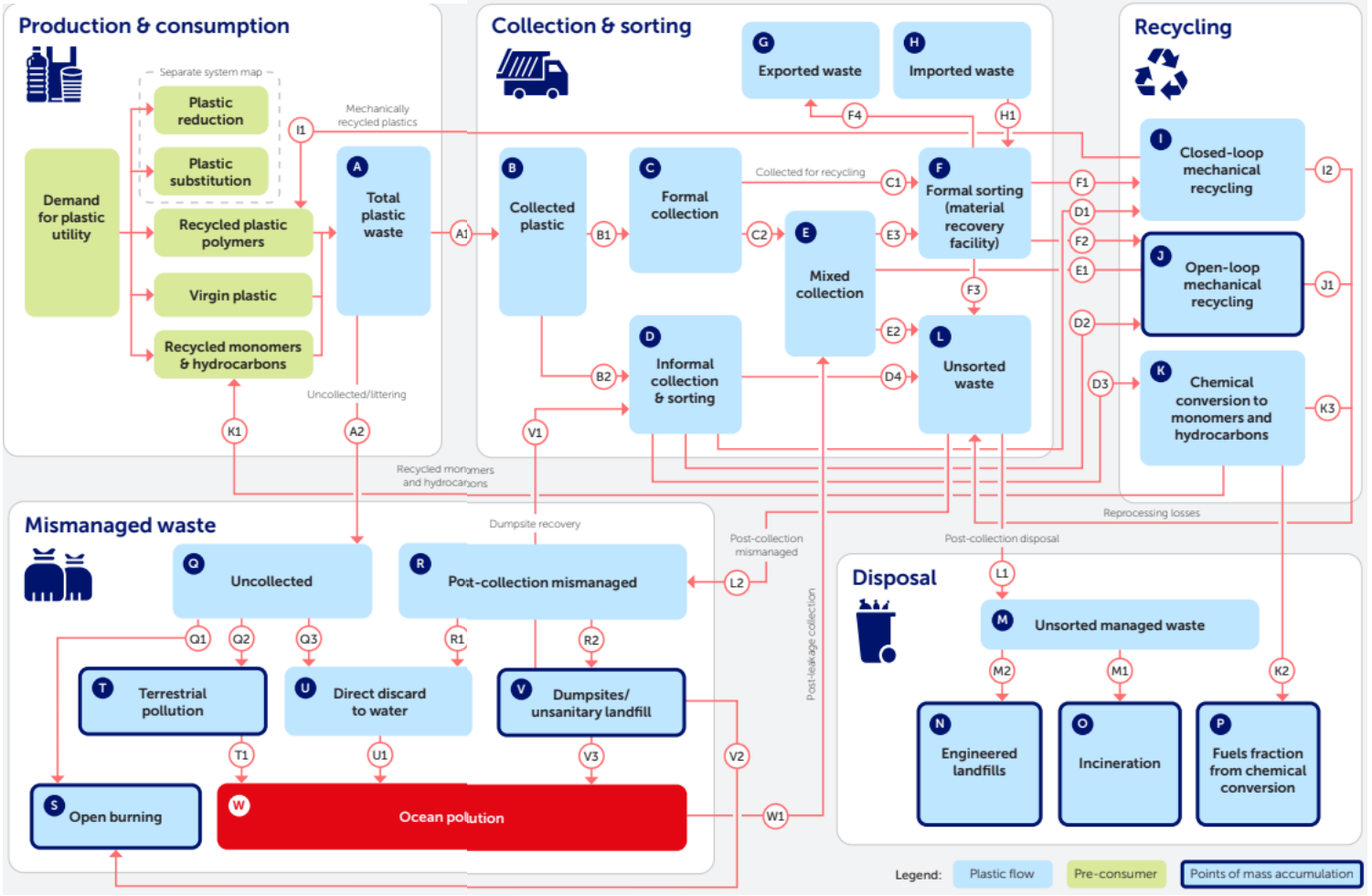
Pathways

One size does not fit all

Pathways can assess your customized plastic system

Data on the plastic value chain from:

- Industry.
- Municipal solid waste authorities.
- Government reports and databases.
- Peer-reviewed articles.
- NGO reports.



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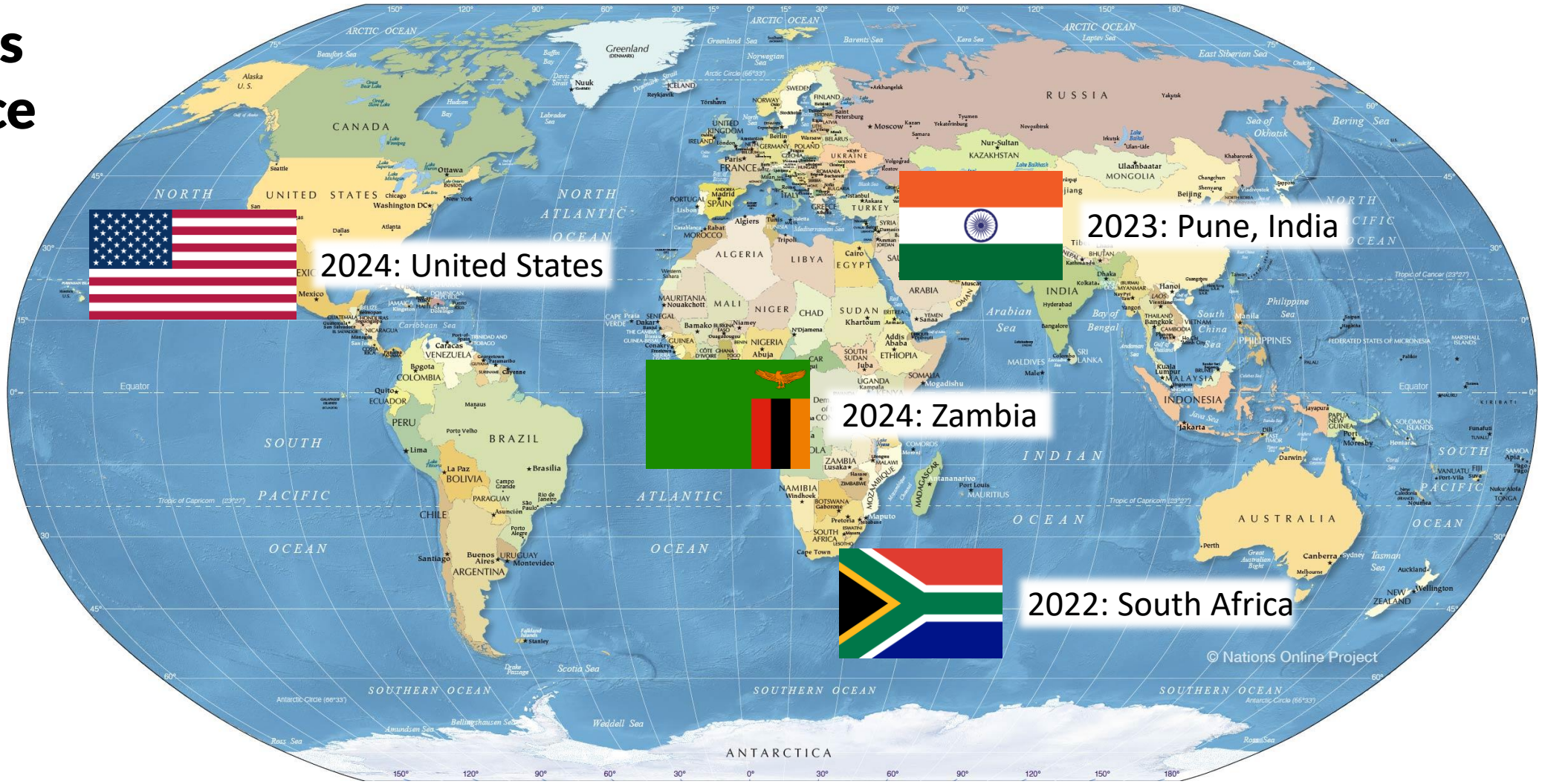
Pathways in practice



Understanding your national plastic system using Pathways: a South African case study

Helping to develop strong, data-driven, locally-relevant policies

Current measures are ineffective in South Africa

1. Increasing demand for plastics

3. Many landfills are non-compliant

2. Backlog in waste collection services leads to open dumping

4. Mismanaged waste leaks into the environment

Pathways on a national level: South Africa

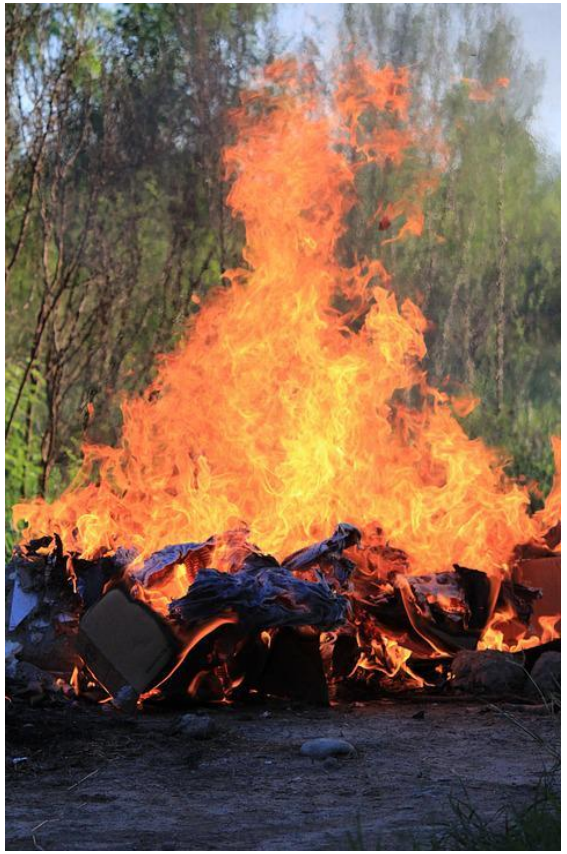
- ❑ Analysis conducted by Council for Scientific and Industrial Research (CSIR)
- ❑ Tailored policy scenarios:

1) How much pollution will there be under Business as Usual?
2) How much will this change under the Extended Producer Responsibility (EPR) targets set for plastic packaging in South Africa?
3) What are the trade-offs between costs and plastic pollution?

1) Plastic pollution increases under Business as Usual

Plastic pollution increases
75%
by 2040

19% of plastic waste
disposed
is recycled

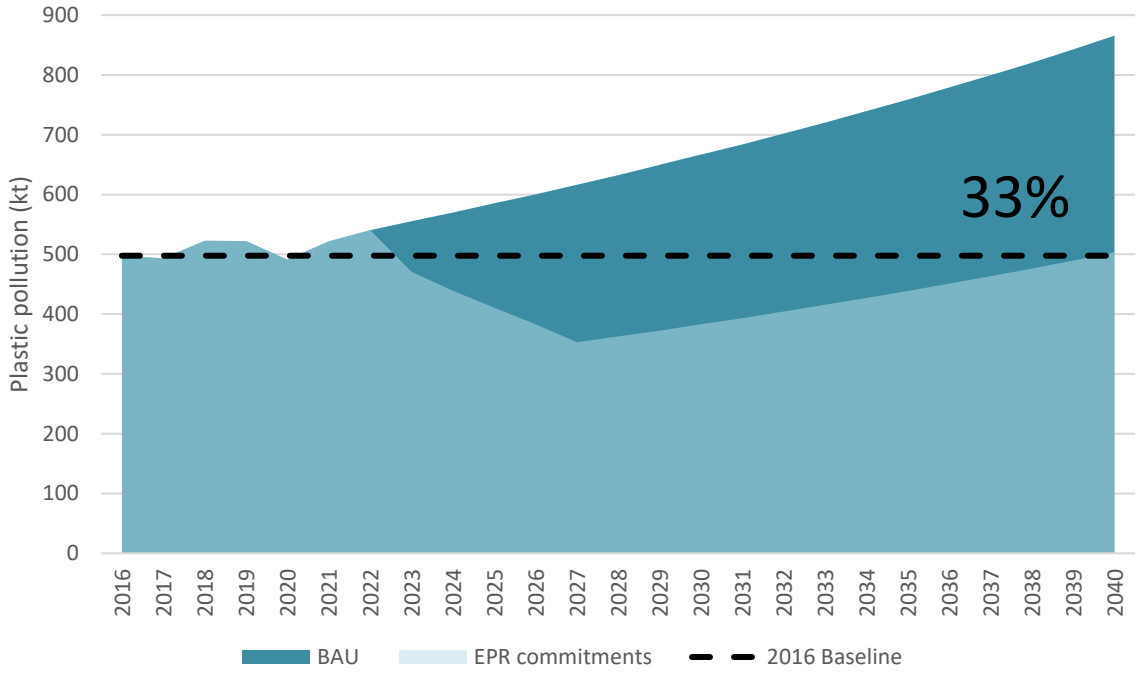


56% of plastic
pollution is from open
burning

Greenhouse gas
emissions rise 63%

2) Extended Producer Responsibility (EPR) targets can reduce plastic pollution if implemented properly

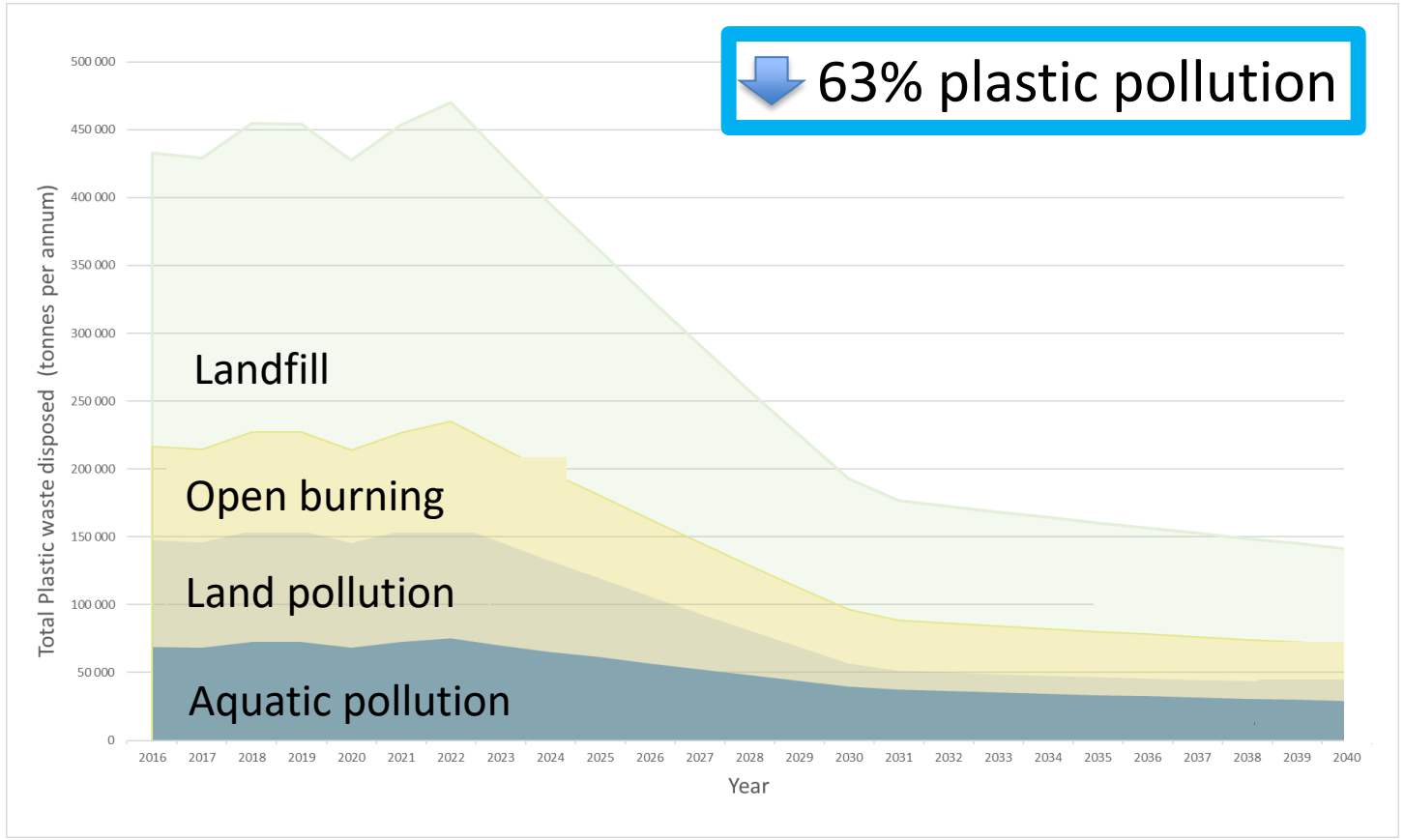
Increasing collection and recycling to meet EPR targets can reduce plastic pollution by **33%,** compared to BAU



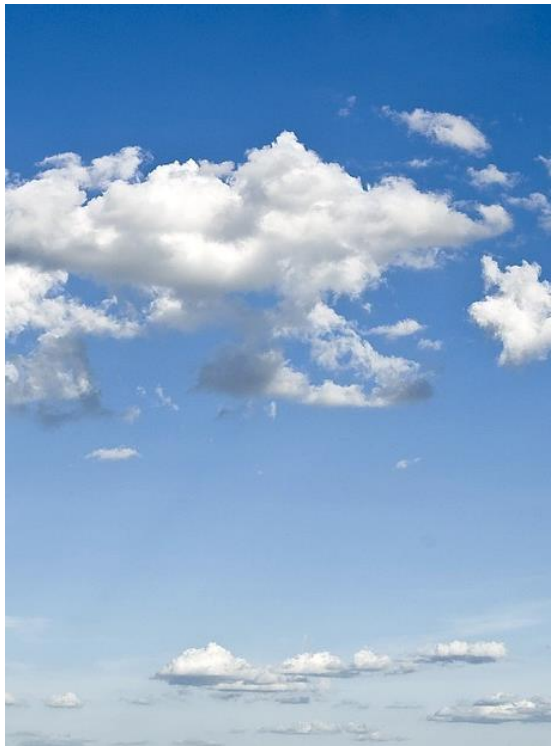
3) System change reduces plastic pollution

Reduce and
Substitute
+
Collect and
Recycle
+
Disposal to
sanitary landfills

=



Potential benefits of system change in South Africa

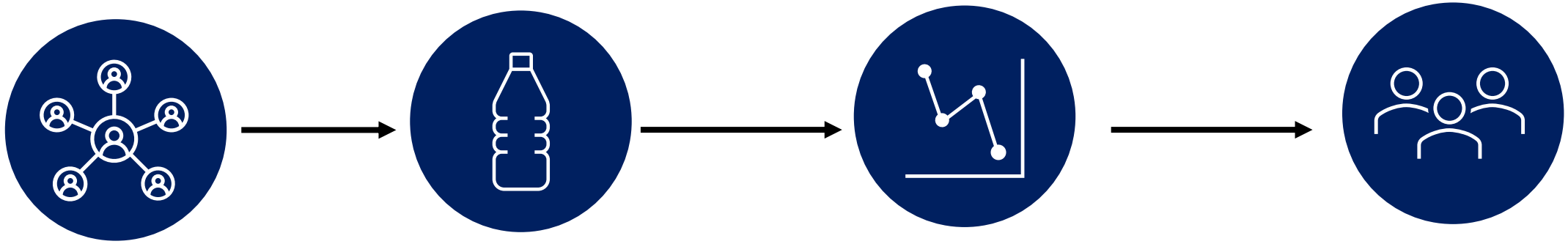


Reduced GHG emissions (37%)

Reduced costs
(67%)

Increased jobs
(3%)

Pathways in Fiji: Pew can support every step of the process



Phase 1

Stakeholder engagement

Phase 2

Data collection

Phase 3

Analysis and interpretation

Phase 4

Share results, stakeholder feedback, policy recommendations

SAMPLE questions for analysis in Fiji

1. What is the extent of primary microplastics being generated in Fiji and how much of it ends up in the ocean?

2. What are the costs and benefits of implementing recommendations such as container deposit legislation or extended producer levy systems?

3. What are the trade-offs of the various end of life options for plastic waste in Fiji?

Questions will depend on your needs

This is **YOUR** process to lead and ours to support

Pew

Thank you!

Questions?

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Pathways download page

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Applicability of the eight interventions from Breaking the Plastic Wave for Fiji's urban and rural populations + main stakeholders responsible

System Intervention	Urban	Rural	Main stakeholder responsible
Reduce growth in plastic consumption	Highly applicable	Highly applicable	Consumer goods brands; retailers
Substitute plastics with suitable alternative materials	Highly applicable	Highly applicable	Consumer goods brands; retailers
Design products and packaging for recycling	Highly applicable	Highly applicable	Consumer goods brands
Expand waste collection rates in the Global South	Highly applicable	Highly applicable	Local governments
Increase mechanical recycling capacity globally	Highly applicable	Highly applicable	Waste management companies
Scale up global capacity of chemical conversion	Highly applicable	Not applicable	Waste management companies; petrochemical industry
Build safe waste disposal facilities	Highly applicable	Highly applicable	National governments
Reduce plastic waste exports	Highly applicable	Somewhat applicable	National governments

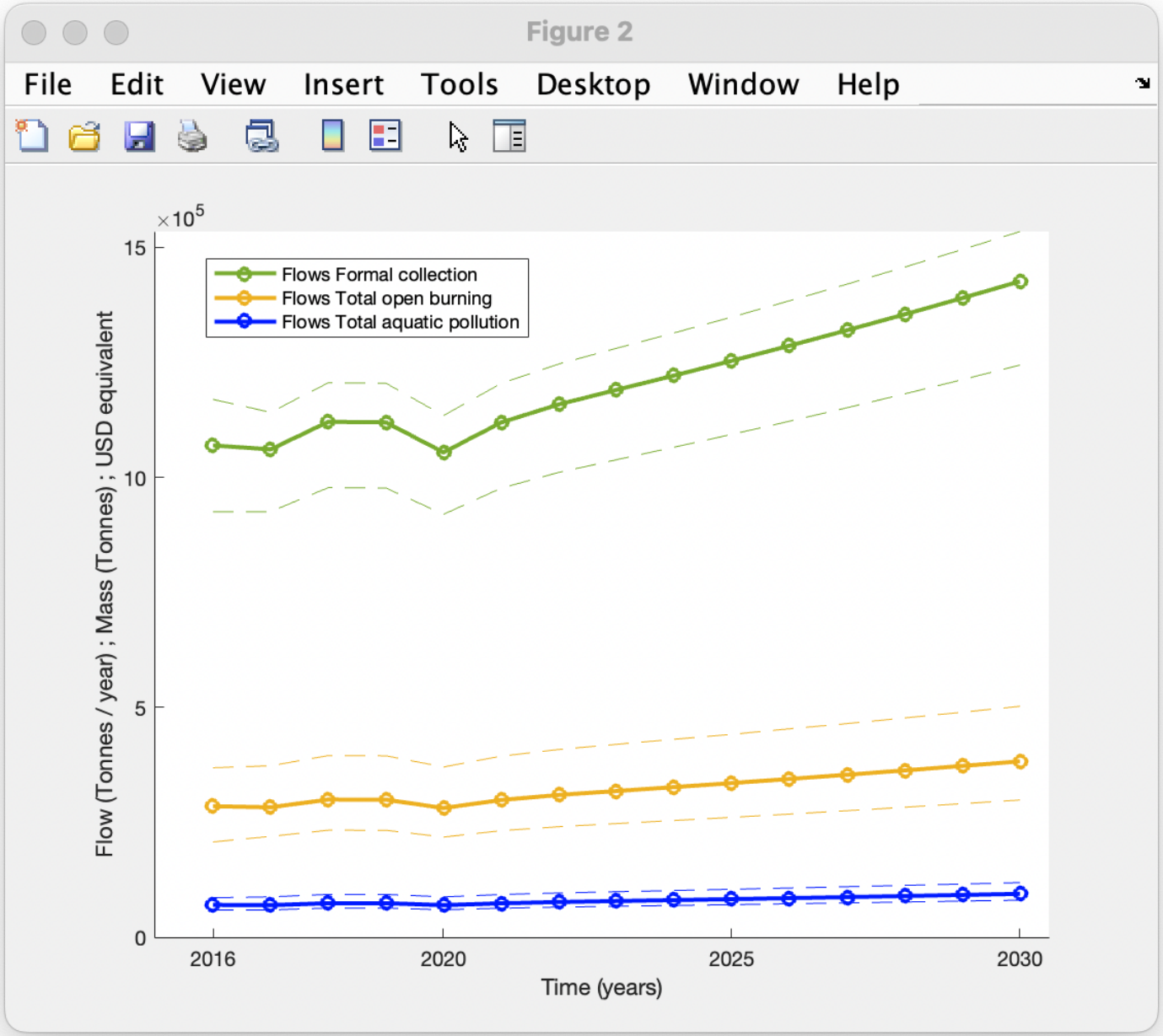
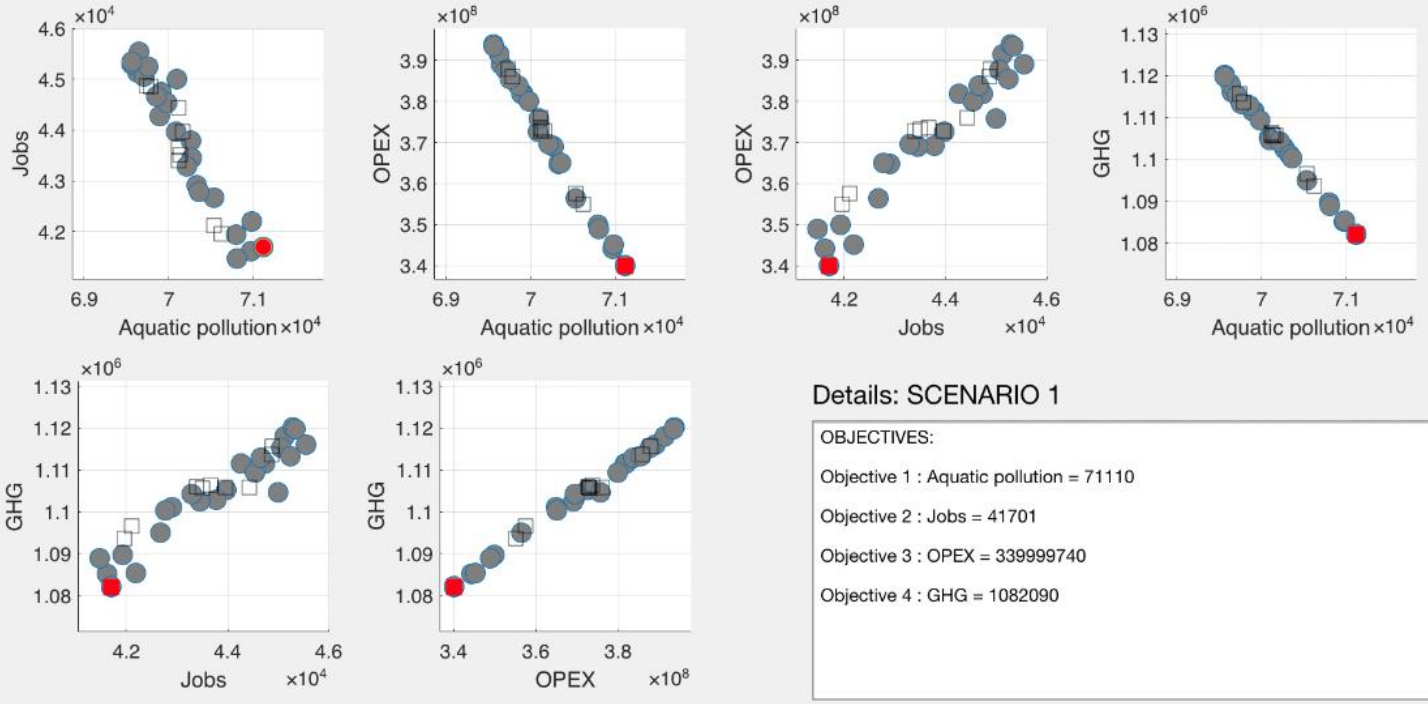


Figure 2
File Edit View Insert Tools Desktop Window Help
×10^5
15
10
5
0
Flow (Tonnes / year) ; Mass (Tonnes) ; USD equivalent
Flows Formal collection
Flows Total open burning
Flows Total aquatic pollution
2016
2020
2025
2030
Time (years)

Run conditions | Plots | Sensitivity | Scenario builder | Scenarios | Model structure | Demand | Demand reduction | Flows | Box constraints | Economics | Transp

Paired trade-offs between objectives



Details: SCENARIO 1

OBJECTIVES:

Objective 1 : Aquatic pollution = 71110

Objective 2 : Jobs = 41701

Objective 3 : OPEX = 339999740

Objective 4 : GHG = 1082090

Select from candidate scenarios

Select from sub-optimal scenarios

Timeseries scaling coefficients:

(1) Flow 3: Box2 CollectedPlastic ----> Box3 FormalCollection:
19.81% / yr, from yr 1

(2) Flow 5: Box3 FormalCollection ----> Box6 FormalSorting:
-16.00% / yr, from yr 1

(3) Flow 7: Box4 InformalCollectSorting ----> Box9 CLMechanicalRecyling:
-19.87% / yr, from yr 1

Export chosen scenario to new input file

Filename for new input file

Brief description (optional)

Create new input file

Choose which model

Example1.xlsx

Choose which flows to analyse

All flows

Selcted flows :

Choose timeframe to assess sensitivities

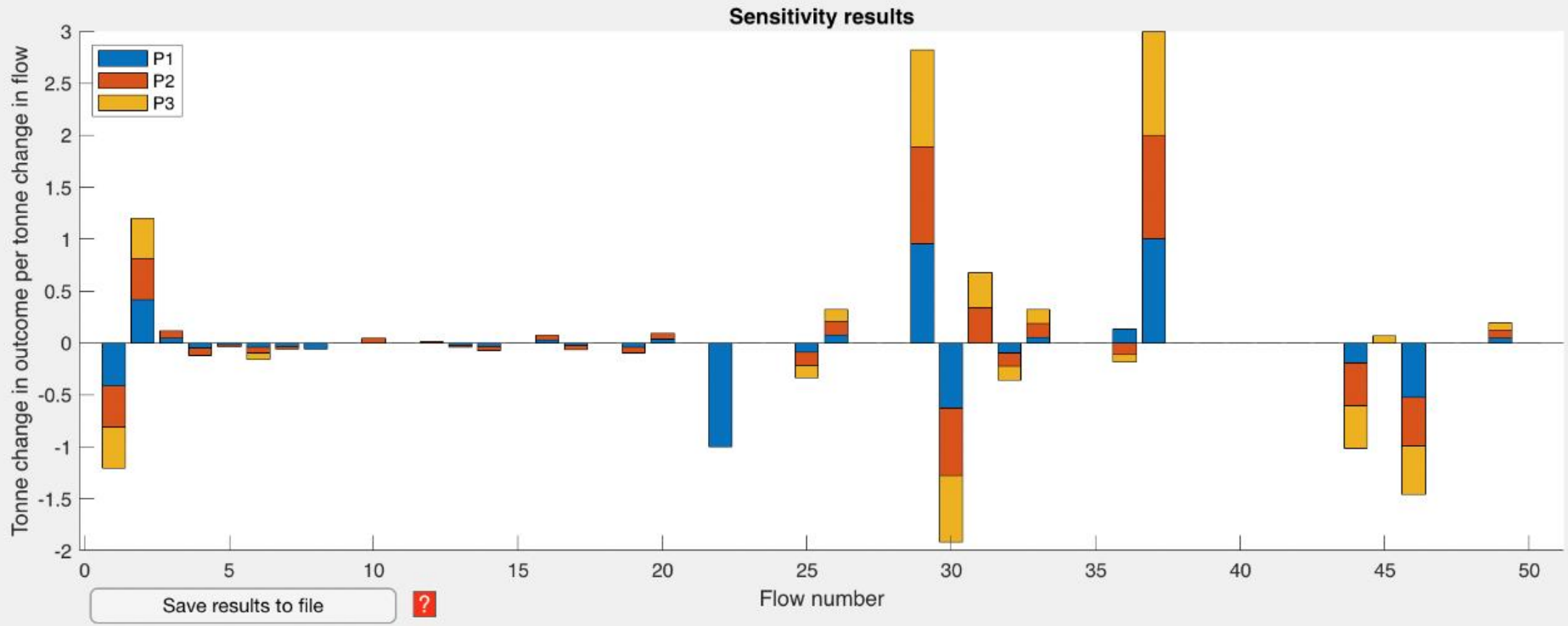
One specific year 1

Sum over all simulated years

Create sensitivity analysis data

Results to display :

Flows_Total_open_burning



Save results to file