Getting Real About Clean Air and Climate Solutions: The Case of Thailand

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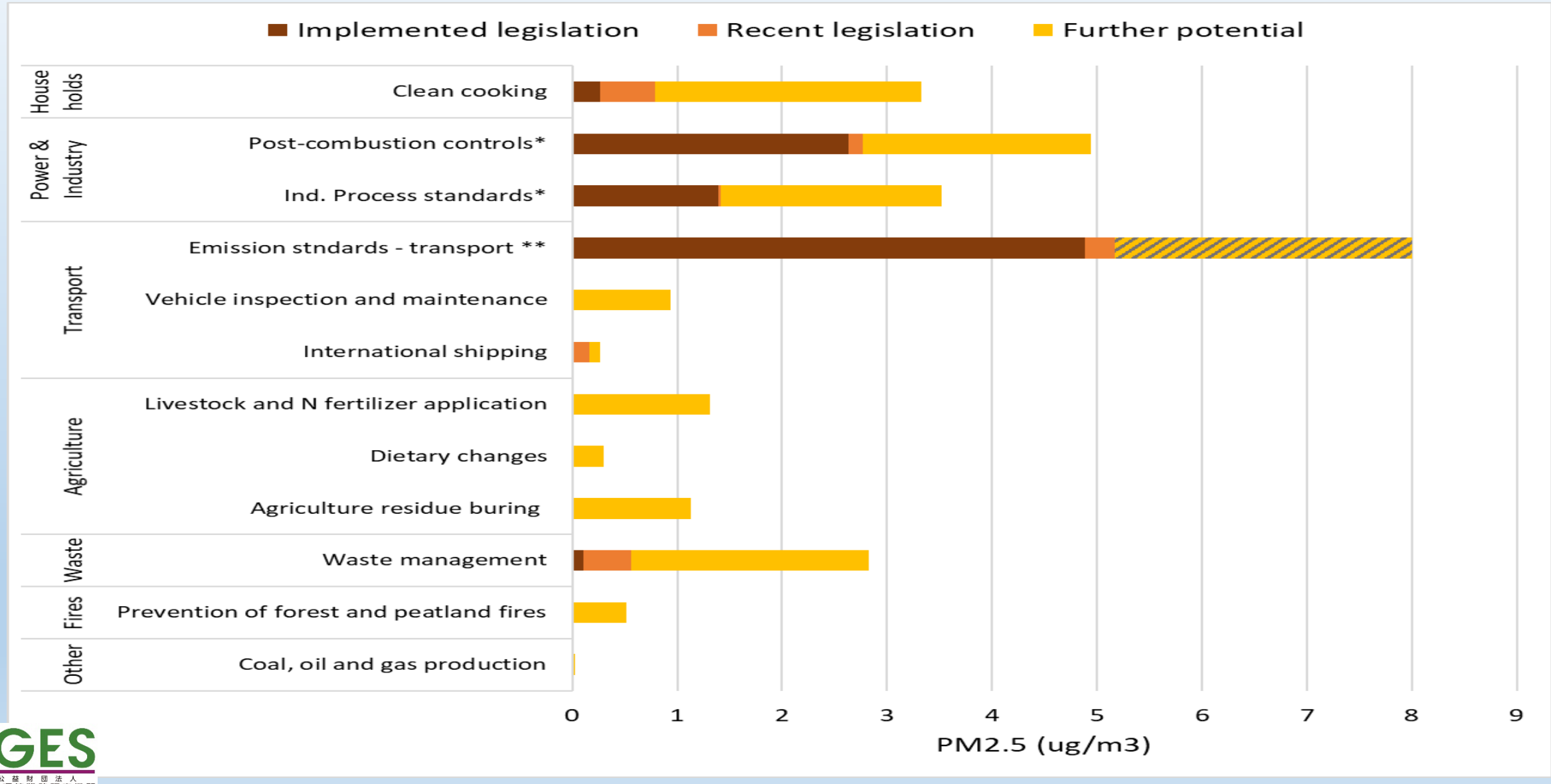
Clean air and climate solutions in Southeast Asia by 2030 (from IIASA GAINs model)

Source: IIASA 2021



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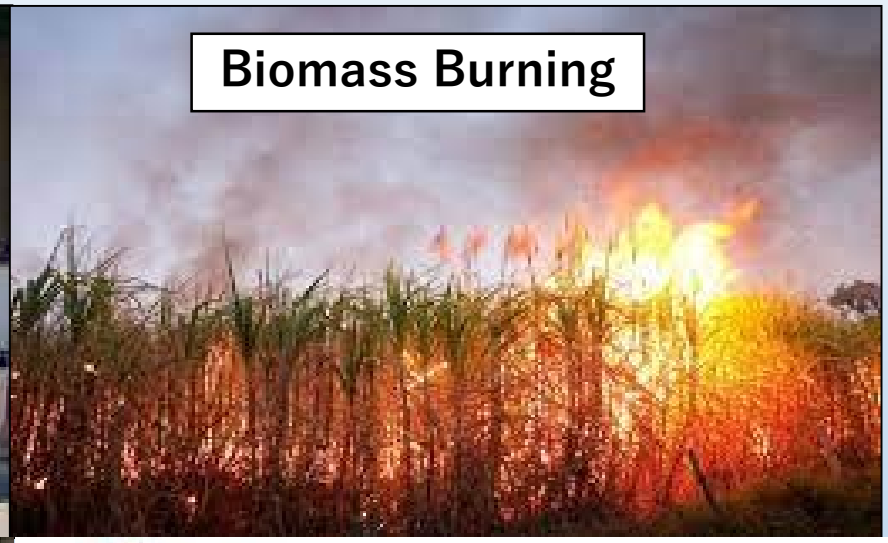
Some success implementing solutions…



Big Question

How can we increase the speed and scale of implementation?


GAINS Online
Greenhouse Gas - Air Pollution Interactions and Synergies
Integrated Assessment


GAINS Online
Greenhouse Gas - Air Pollution Interactions and Synergies
Assessment Models
Feasibility Assessment

Research Objectives

1. To estimate how much economic, technical, social and institutional feasibility affect timing and speed of solutions

2. To estimate how much it costs to overcome social and institutional barriers

3. To strengthen integration between feasibility analysis and integrated assessment modeling

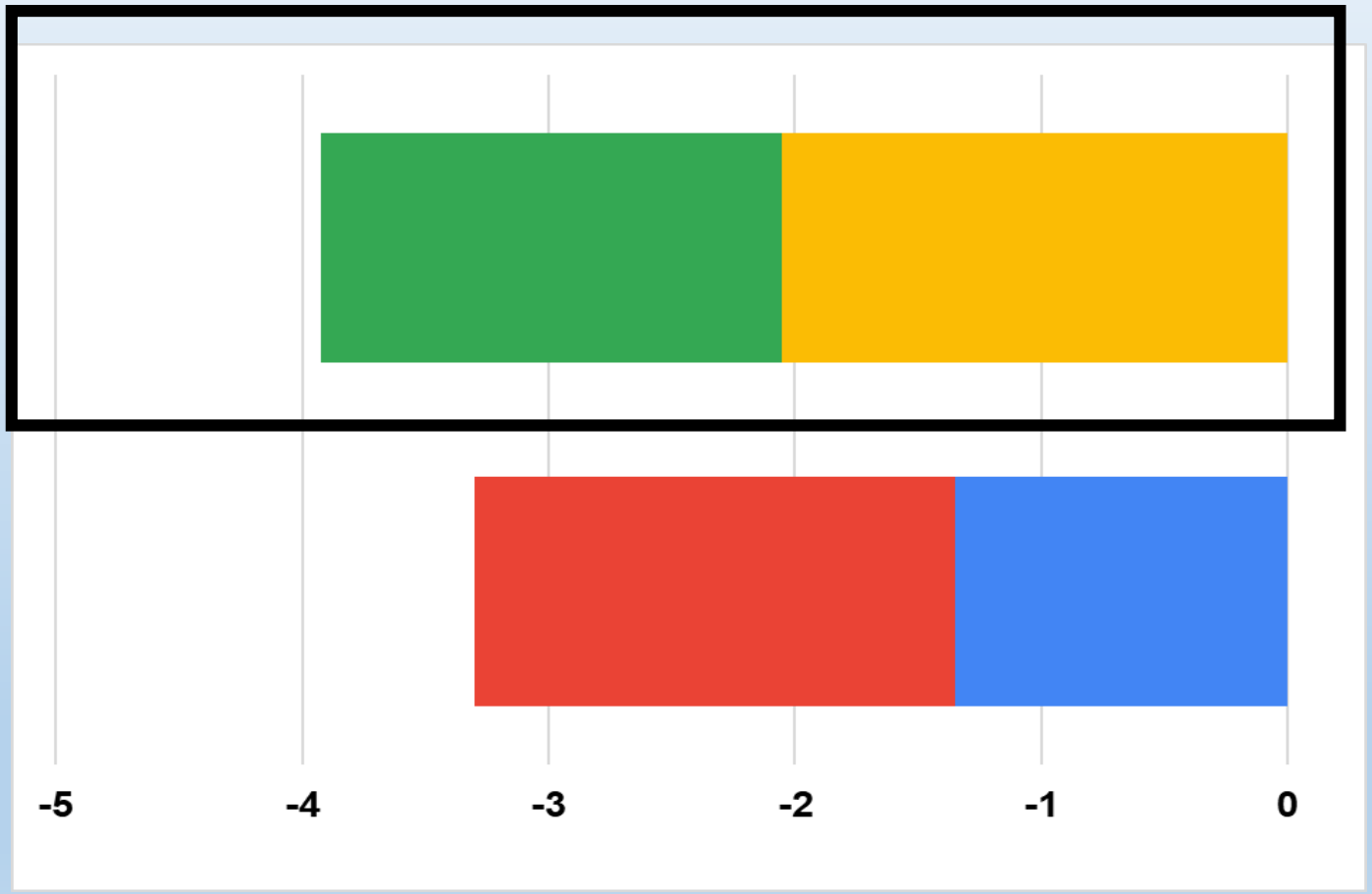
Three steps to assess feasibility

1. Expert surveys: targeted questions about effects of barriers for 30 experts per solution

2. Literature review: about 5-10 articles per measure coded to translate into quantitative assessment of barrier effects

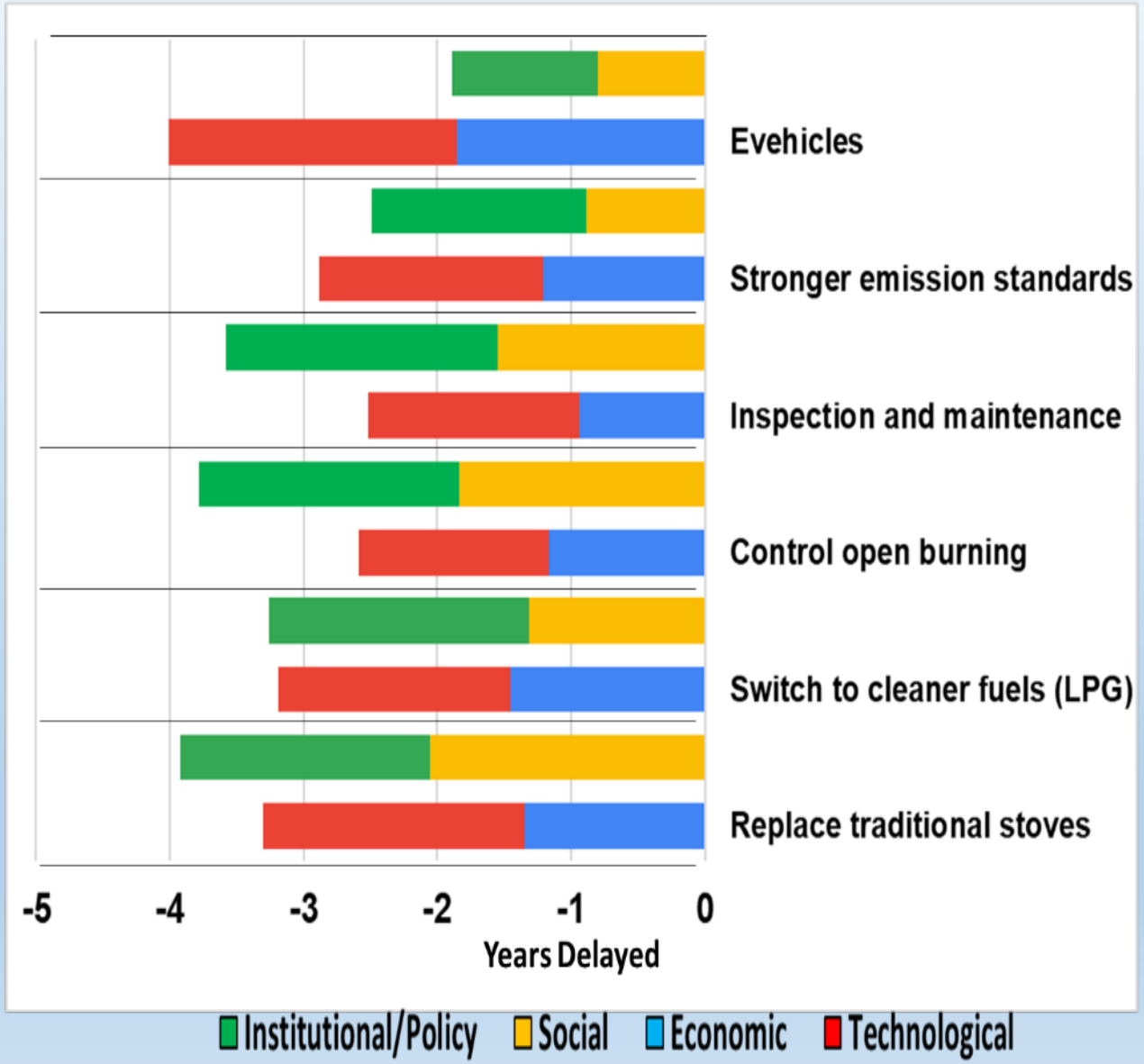
3. Combined experts survey with literature review: using weighted average to arrive at composite estimate of barrier size

Cookstove example: the social and institutional barriers slow implementation by nearly 4 years over a 10 year period in Thailand



How about other solutions?

- Implementation slowed by between 6-7 years over 10 year period for all solutions when all barriers combined
- Social and institutional barriers are large/greater than technical and economic barriers in many cases
- Social and institutional barriers can be more explicitly integrated into assessment models



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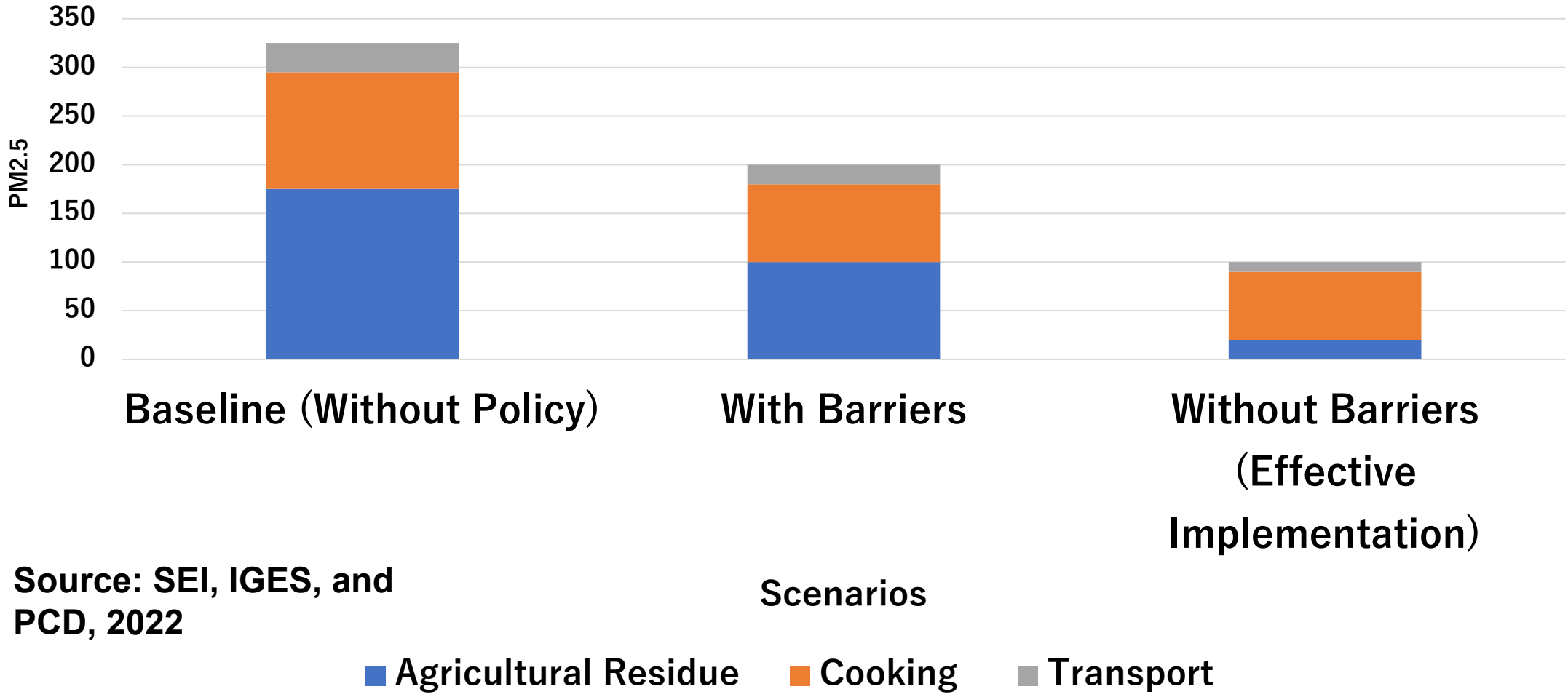
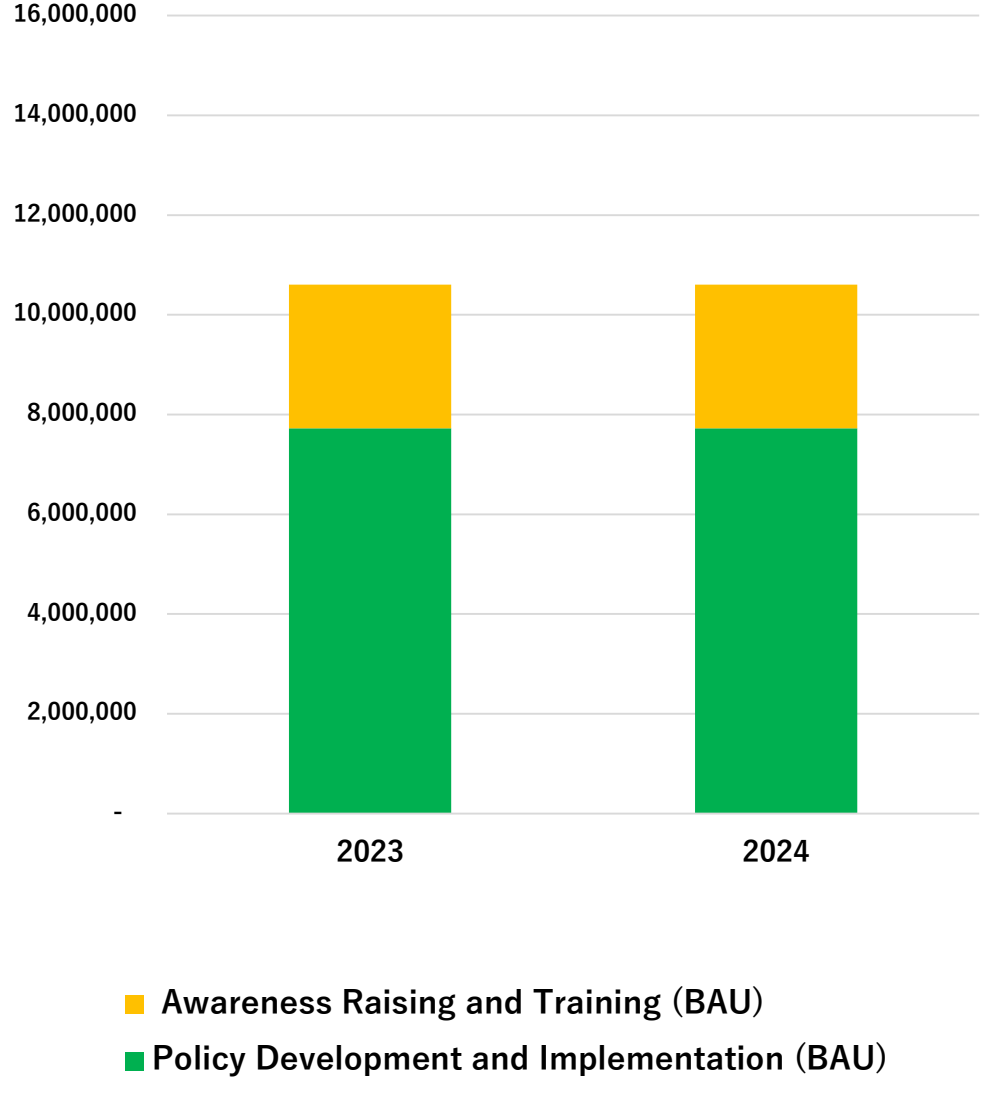
Impact of Barriers/Delays on Key Sectors in Thailand in 2030

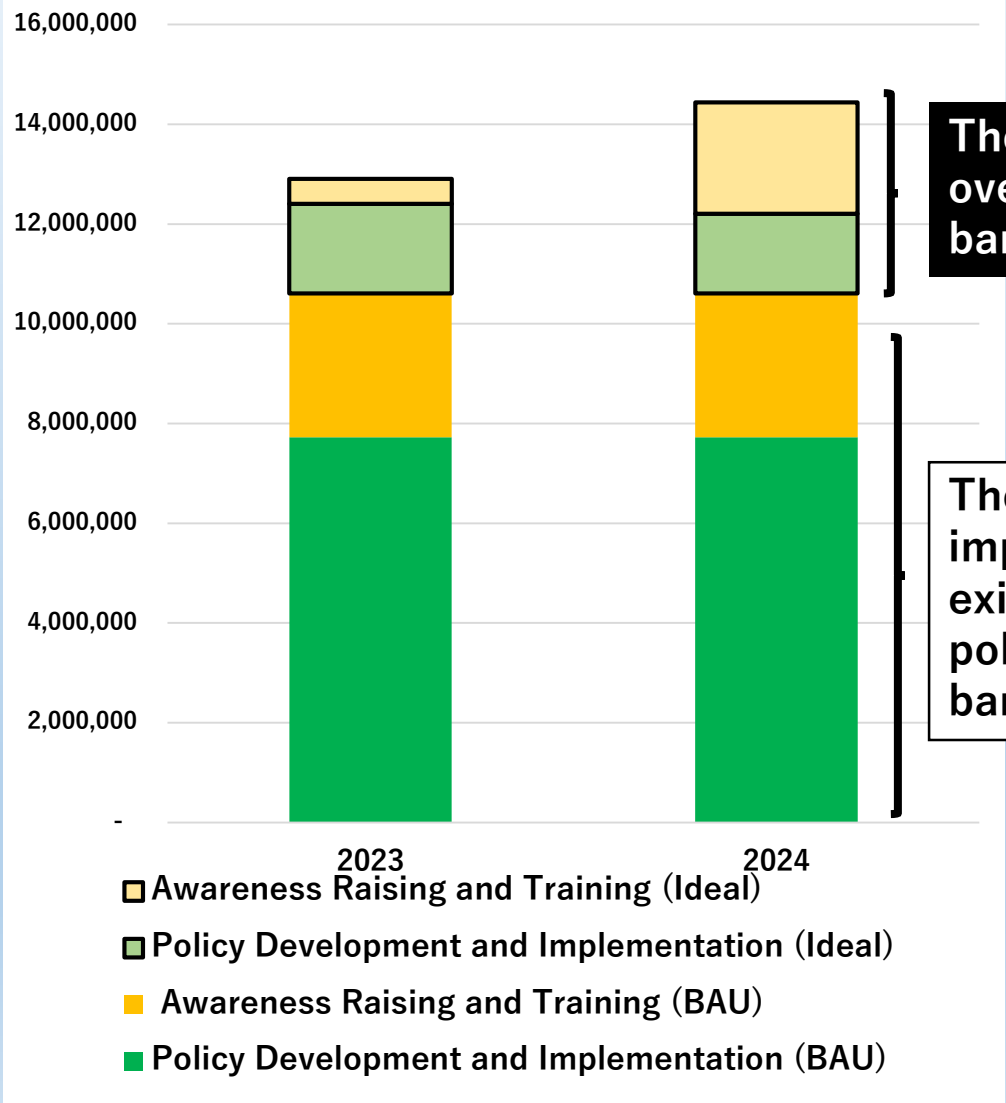


Source: SEI, IGES, and PCD, 2022

What is the cost to overcome institutional and social barriers for cookstoves in Thailand?

Thai Bhat





Findings and way forward

- Integrate assessment models have identified clean air and climate solutions with many benefits
- Need to increase speed and scale of implementation to achieve these benefits
- Assessing institutional and social feasibility can help make models more realistic…
- And identify reforms enabling quick and widespread implementation of solutions
- Institutional feasibility also critical for implementing cross-boundary (rural-urban) and cross-sectoral solutions in this and next session
- IGES wants to work with IIASA, ACAP, Kyoto University and other partners to develop a generalizable multidimensional feasibility framework for assessment modelling

$$\bar{x}_j = \frac{\sum_{i=1}^{n} s_{j,i}}{n}$$

$\bar{x}_j$	average magnitude of barrier type j based on the expert survey
j	type of barrier (i.e. technological, economic, social and institutional barriers)
$s_{j,i}$	the size of effects of barrier type from each expert survey response
i	each expert survey response
n	the total number of responses to expert survey

$$B_j = 0.7\bar{x}_j + 0.3y_j$$

B_j	magnitude of barrier type
j	type of barrier (i.e. technological, economic, social and institutional barriers)
$\bar{x}_j$	average magnitude of barrier type j based on the expert survey
y_j	magnitude of barrier type based on literature review
i	each expert survey response

$$TD = \sum_j B_j \cdot T$$

TD	time delayed due to barriers
B_j	magnitude of barrier type
j	type of barrier (i.e. technological, economic, social and institutional barriers)
T	the maximum delayed period (i.e. 10 year).

Ranges of Scores in Thailand (with Sensitivity Analysis)

		Range	60 Survey/40 Lit	70 Survey/30 Lit	80 Survey/20 Lit
Evehicles	Tech/eco	.33	-4.01	-3.84	-3.67
	Soc/inst	.30	-1.89	-2.04	-2.19
Stronger emission standards	Tech/eco	.04	-2.88	-2.86	-2.84
	Soc/inst	.16	-2.49	-2.57	-2.65
Inspection and maintenance	Tech/eco	.17	-2.51	-2.60	-2.69
	Soc/inst	.14	-3.58	-3.51	-3.44
Control open burning	Tech/eco	.20	-2.59	-2.69	-2.79
	Soc/inst	.41	-3.78	-3.58	-3.37
Switch to cleaner fuels (i.e. LPG)	Tech/eco	.27	-3.19	-3.06	-2.92
	Soc/inst	.25	-3.26	-3.14	-3.02
Replace traditional stoves	Tech/eco	.25	-3.24	-3.11	-2.98
	Soc/inst	.39	-3.82	-3.63	-3.43