

DEVELOPING ACTIONS FOR LOW CARBON CITIES IN MALAYSIA

THE CASE OF **GREEN HOME** PENETRATION IN CITIES

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WHY **GREEN** HOMES?

Green homes penetration rate in Malaysia estimated at:

< 2% !!!

An important sector to contribute to LCS; potential to increase penetration rate to:

= 75% by 2050

What constraints / barriers will we likely face?

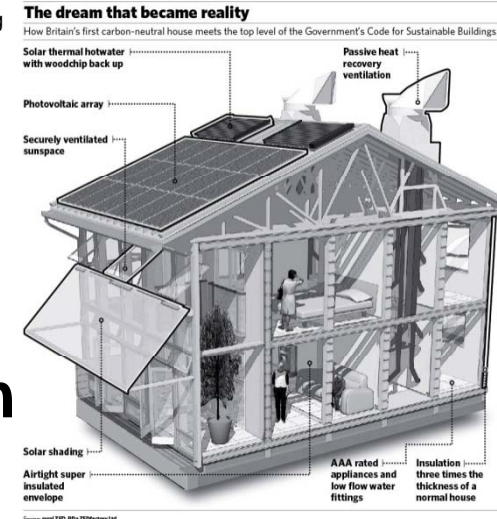
What options are available to us for overcoming the constraints / barriers?

FUTURE OBJECTIVES

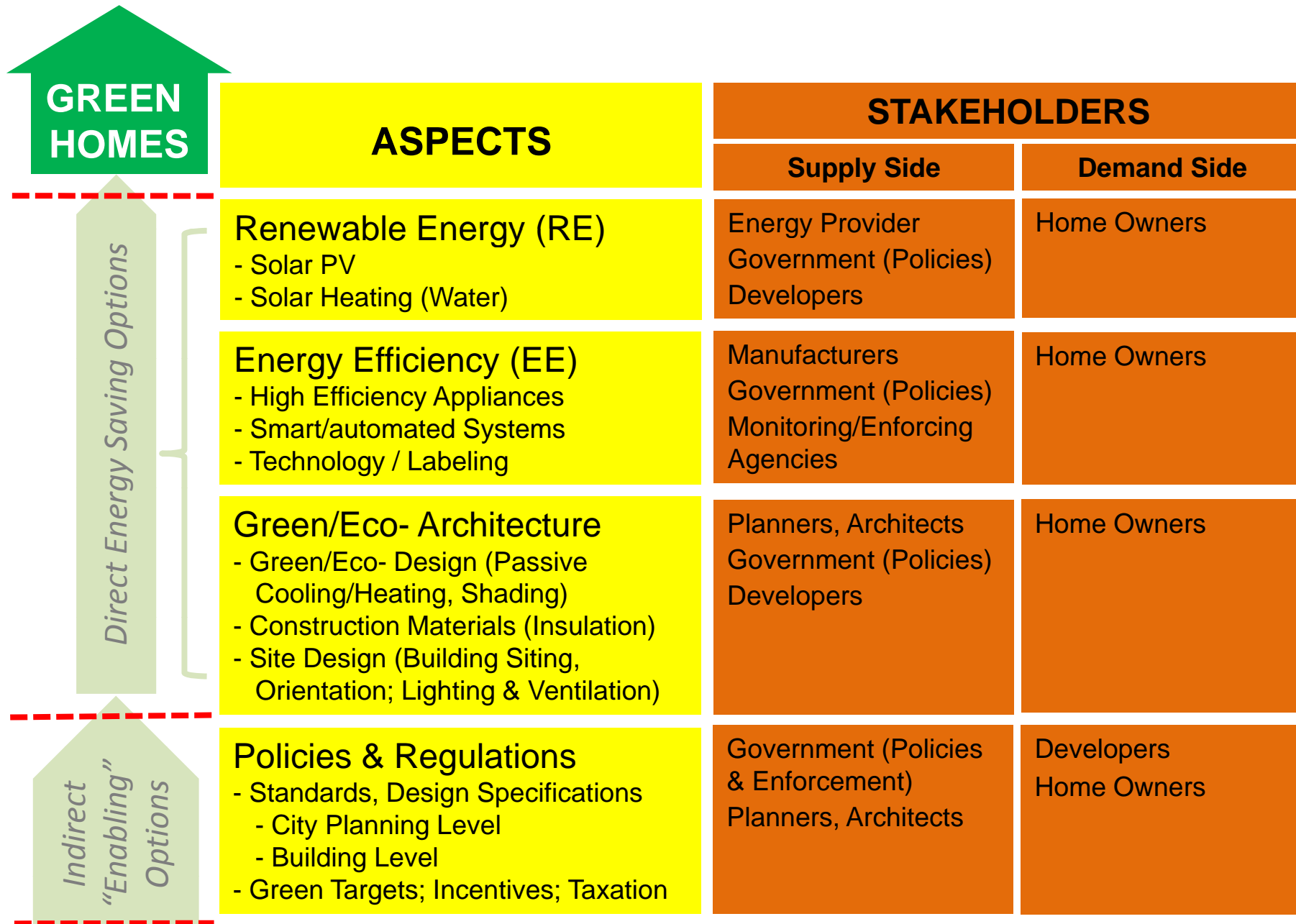
1 Increase percentage of penetration of renewable energy (RE) in Malaysian homes

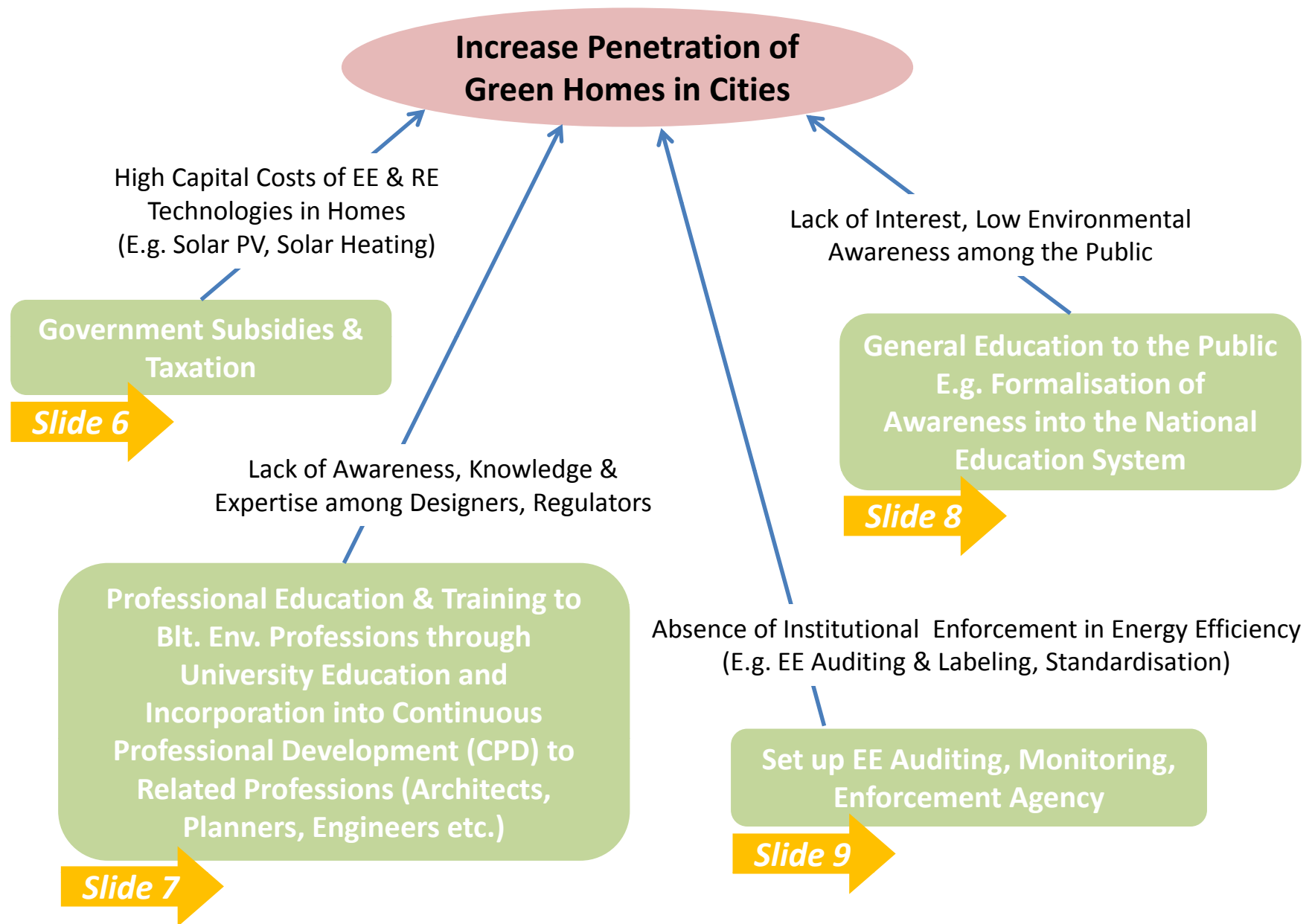
2 Enhance energy efficiency (EE) level of Malaysian homes

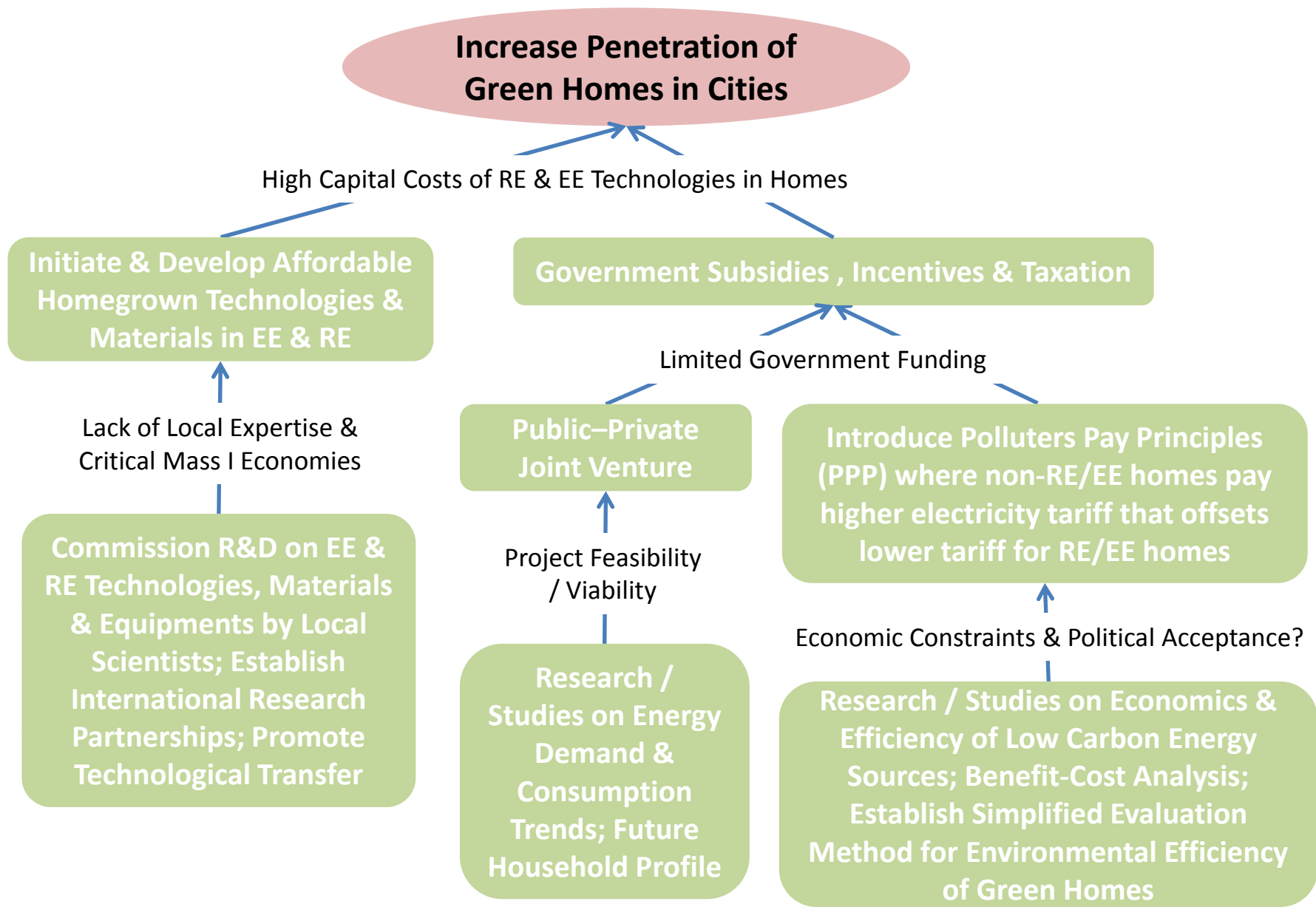
3 Develop expertise & skills in RE & EE Technologies among built environment professionals



http://img.thisismoney.co.uk/i/pix/2007/06/GreenHouse_477x610.jpg







Increase Penetration of Green Homes in Cities

Lack of Awareness, Knowledge & Expertise among Designers, Regulators in Green Home Economics, Design, Delivery, Co-benefits etc.

Introduce Professional Education & Training to Bld. Env. Professions through University Education; Ongoing Syllabus Review

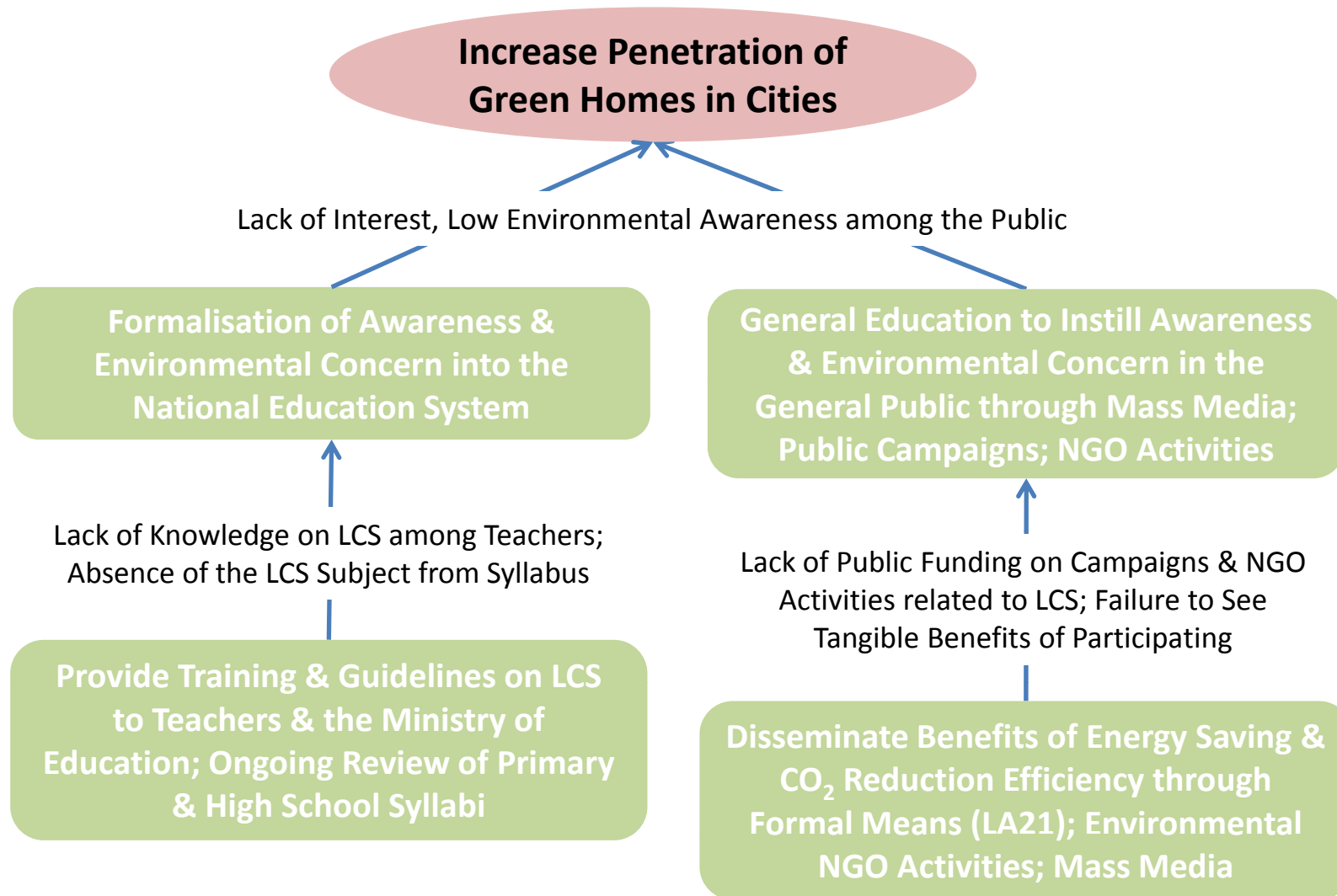
Provide (Re)Training; Encourage Continuous Learning on LCS; Organise Seminars/Workshops

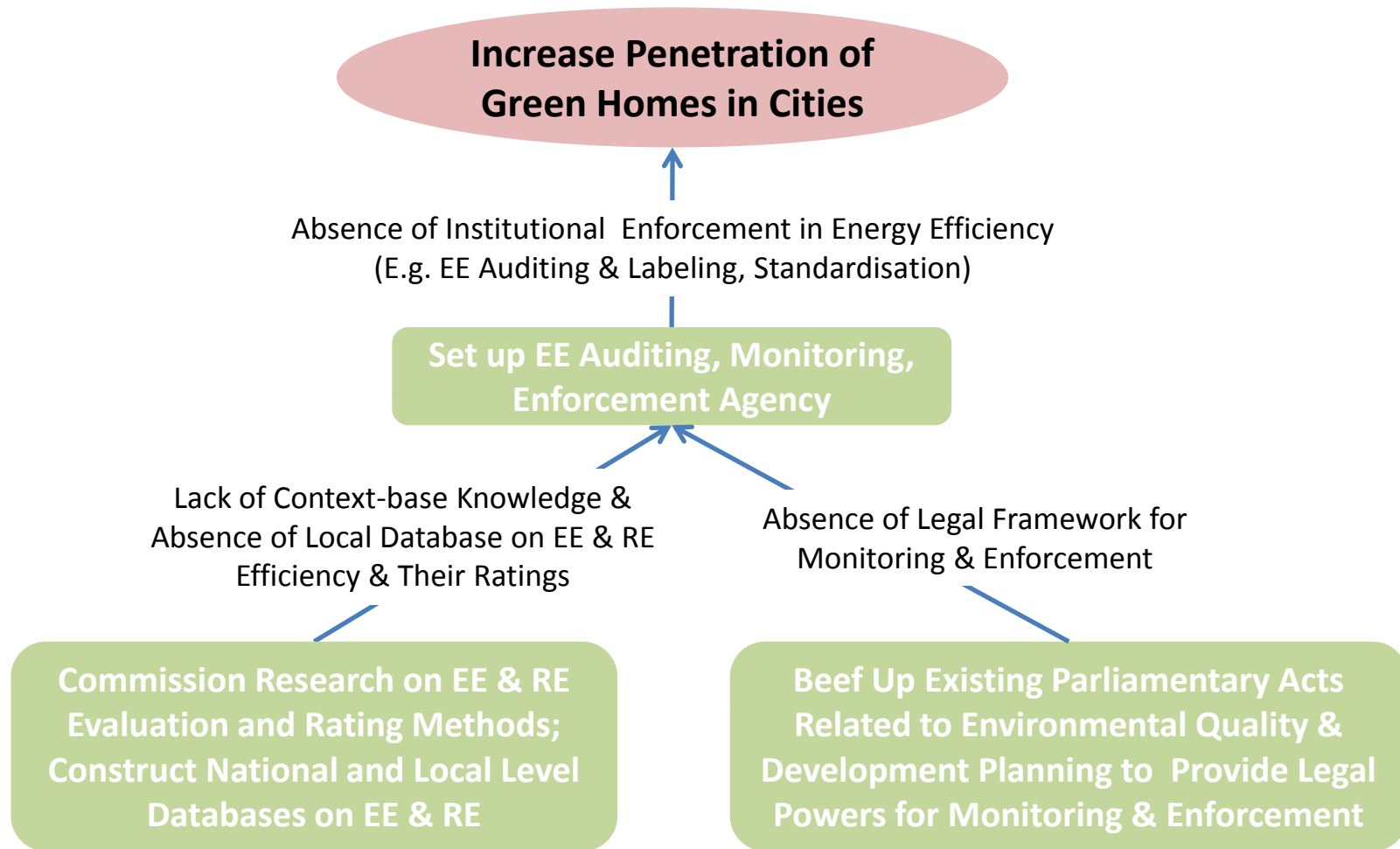
Institutional Inertia; Resistance to New Ideas; Lack of Motivation (Market, Incentives)

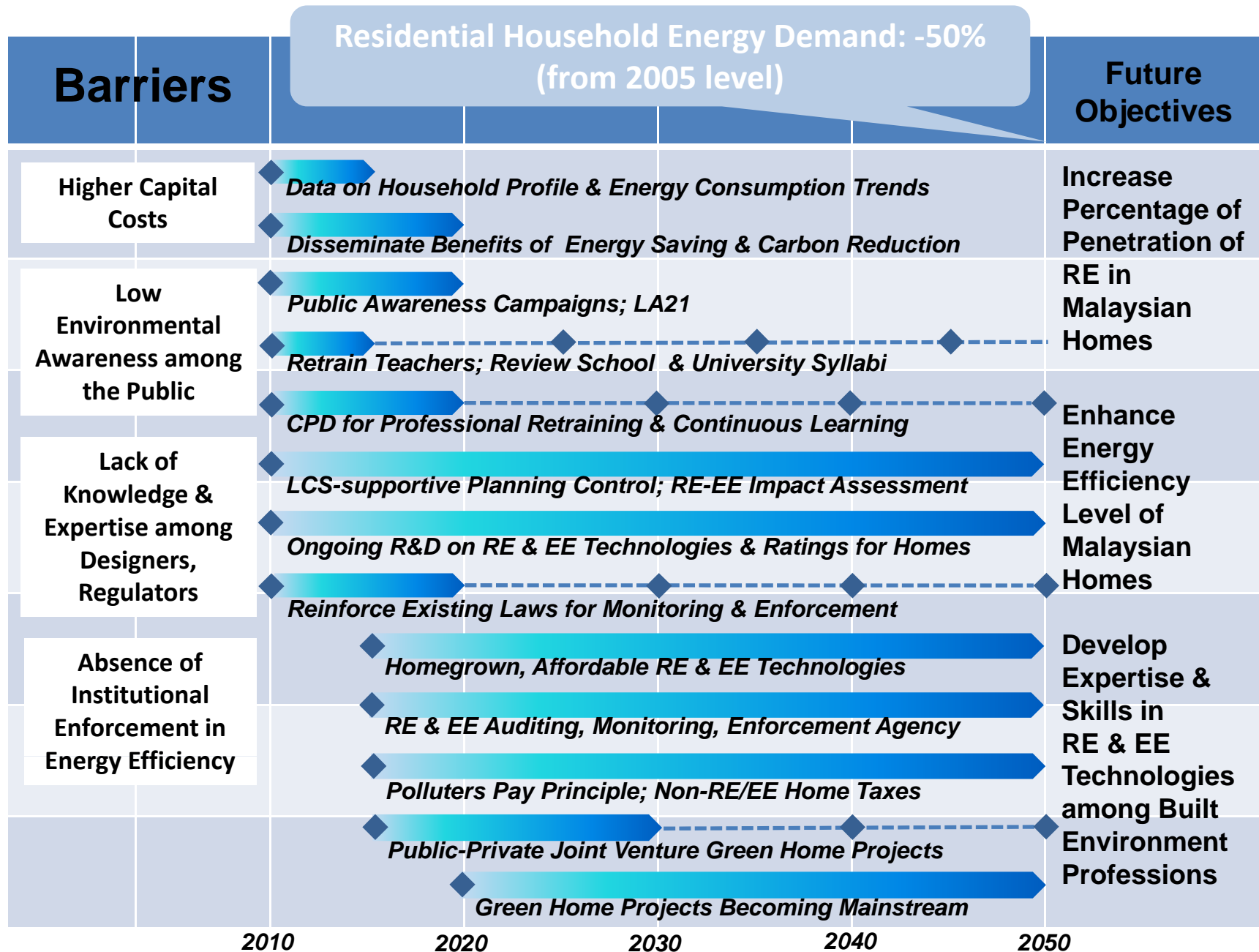
Institutionalisation of Continuous Professional Development (CPD) as Incentives to Continuous Learning in LCS

Disseminate Diagnosis for Energy Saving & CO₂ Reduction Efficiency to Professionals

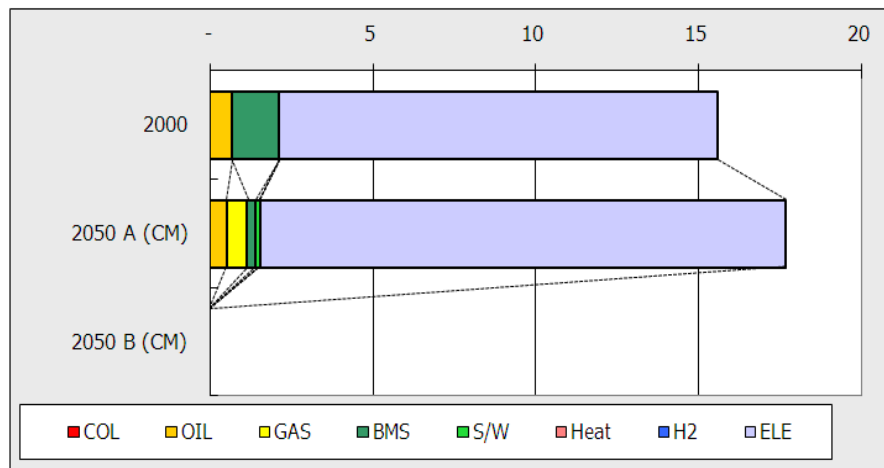
Introduce LCS-Supportive Planning Control through Expediting Planning Approval & Building Plan Approval of Low-Carbon Green Homes Proposal; Introduce 'EE-RE Impact Assessment' in Project Approval



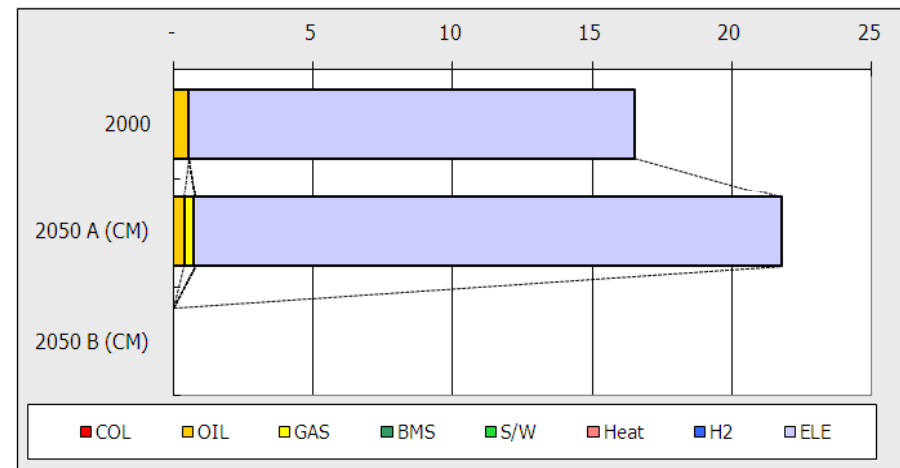




ENERGY CONSUMPTION & CO₂ EMISSION OF THE RESIDENTIAL SECTOR IN MALAYSIA (OUTPUT FROM THE ESS MODEL)



Energy consumption in residential sector (Mtoe)



CO₂ emission in residential sector with allocated emission from heat, H₂, electricity (MtC)

APPLICATION OF THE AIM BACKCASTING MODEL (V.1.414) ON THE RESIDENTIAL SECTOR IN MALAYSIA

ENERGY EFFICIENCY (EE) IN HOUSEHOLD APPLIANCES/EQUIPMENTS:

SPACE COOLING

WATER HEATING

LIGHTING

COOKING

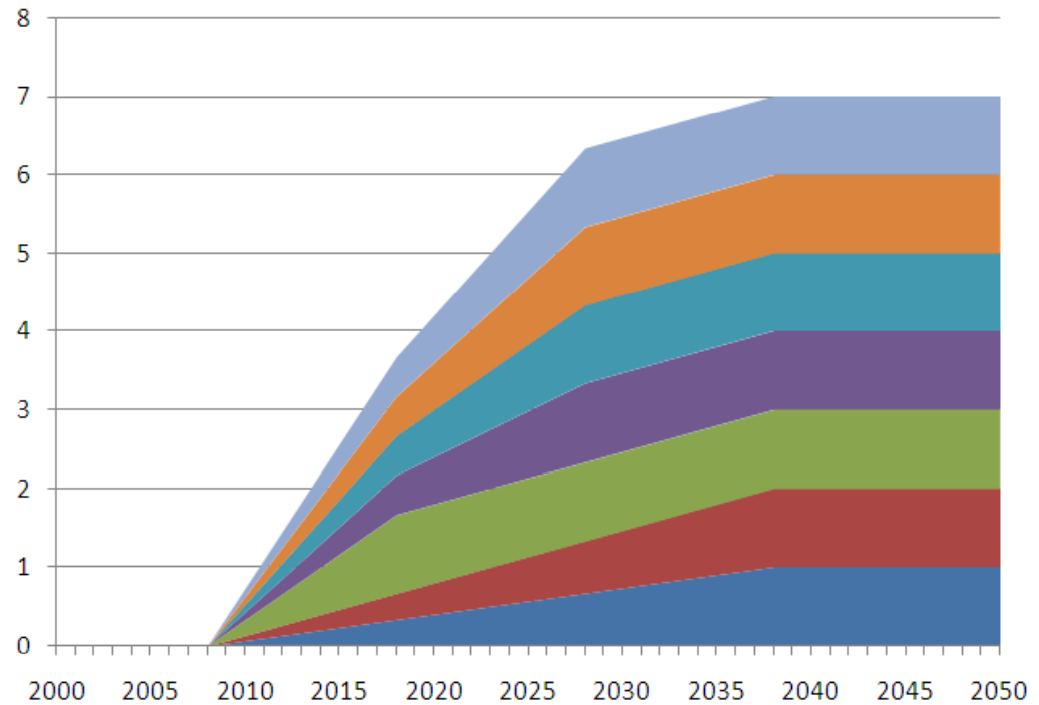
REFRIGERATION

APPLIANCES

ICT

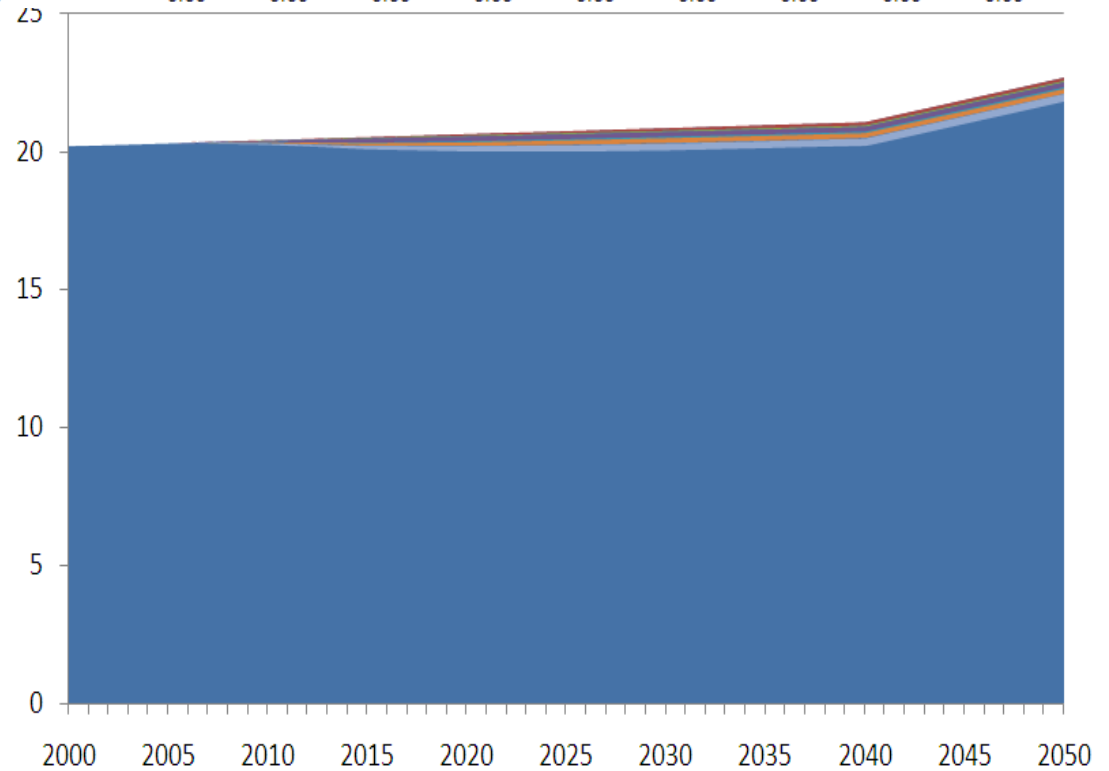
Back to Title		Results Update		Filter	Set	Option Sets : 6 New Option Sets 6		Load	RES	Show ESS	Penetration	Show Graph			
Avail.	No.	Options	Edit Data	Penet	Years										
					2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
X	1	EE on cooling	%	0%	0%	0%	7%	23%	40%	57%	73%	90%	100%	100%	100%
X	2	EE on water heating	%	0%	0%	0%	7%	23%	40%	57%	73%	90%	100%	100%	100%
X	3	EE on lighting	%	0%	0%	0%	20%	70%	100%	100%	100%	100%	100%	100%	100%
X	4	EE on cooking	%	0%	0%	0%	10%	35%	60%	85%	100%	100%	100%	100%	100%
X	5	EE on referigeration	%	0%	0%	0%	10%	35%	60%	85%	100%	100%	100%	100%	100%
X	6	EE on appliance	%	0%	0%	0%	10%	35%	60%	85%	100%	100%	100%	100%	100%
X	7	EE on ICT	%	0%	0%	0%	10%	35%	60%	85%	100%	100%	100%	100%	100%

PENETRATION (%) OF EE TECHNOLOGIES IN MALAYSIAN HOMES



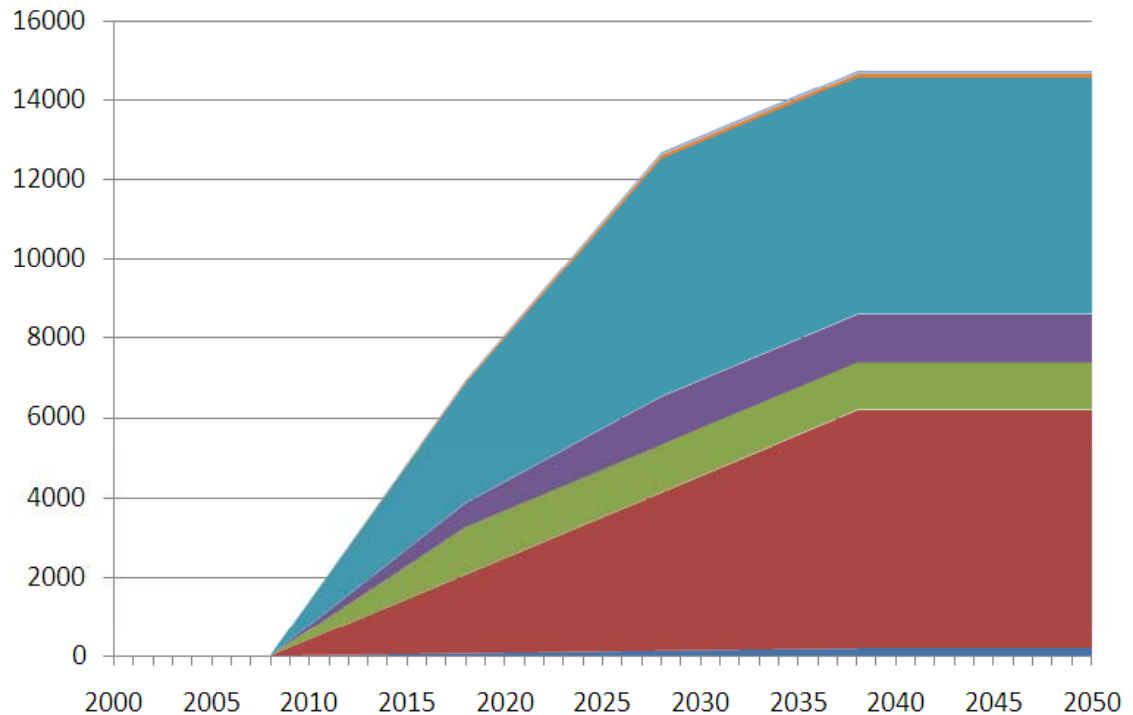
Back to Title	Results Update	Filter	Set	Option Sets :	6 New Option Sets 6	Load	RES	Show ESS	CO2	Show Graph						
Avail.	No.	Options	Edit Data	CO2	Years	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
X	1	EE on cooling	tc	0.00	0.00	0.00	-0.01	-0.04	-0.06	-0.08	-0.10	-0.12	-0.12	-0.12	-0.12	-0.12
X	2	EE on water heating	tc	0.00	0.00	0.00	-0.01	-0.02	-0.03	-0.04	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
X	3	EE on lighting	tc	0.00	0.00	0.00	-0.06	-0.14	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
X	4	EE on cooking	tc	0.00	0.00	0.00	-0.02	-0.04	-0.06	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
X	5	EE on refrigeration	tc	0.00	0.00	0.00	-0.03	-0.09	-0.13	-0.16	-0.18	-0.18	-0.18	-0.18	-0.18	-0.18
X	6	EE on appliance	tc	0.00	0.00	0.00	-0.05	-0.14	-0.21	-0.26	-0.28	-0.28	-0.28	-0.28	-0.28	-0.28
X	7	EE on ICT	tc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CO₂ REDUCTION AS A RESULT OF EE TECHNOLOGIES IN MALAYSIAN HOMES



Back to Title		Results Update		Filter	Set	Option Sets : 6 New Option Sets 6		Load	RES	Show ESS	Cost	Show Graph			
Avail.	No.	Options	Edit Data	Cost	Years										
					2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
X	1	EE on cooling			0.00	0.00	12.36	43.26	74.16	105.06	135.96	166.86	185.40	185.40	185.40
X	2	EE on water heating	B-JPY		0.00	0.00	400.00	1400.00	2400.00	3400.00	4400.00	5400.00	6000.00	6000.00	6000.00
X	3	EE on lighting	B-JPY		0.00	0.00	240.00	840.00	1200.00	1200.00	1200.00	1200.00	1200.00	1200.00	1200.00
X	4	EE on cooking	B-JPY		0.00	0.00	120.00	420.00	720.00	1020.00	1200.00	1200.00	1200.00	1200.00	1200.00
X	5	EE on refrigeration	B-JPY		0.00	0.00	600.00	2100.00	3600.00	5100.00	6000.00	6000.00	6000.00	6000.00	6000.00
X	6	EE on appliance	B-JPY		0.00	0.00	9.27	32.45	55.62	78.80	92.70	92.70	92.70	92.70	92.70
X	7	EE on ICT	B-JPY		0.00	0.00	6.18	21.63	37.08	52.53	61.80	61.80	61.80	61.80	61.80

COST INCURRED IN TECHNOLOGIES IN MALAYSIAN HOMES



Thank you for your kind attention