



Regulatory frameworks and reforms to spur renewable energy investment

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We help our clients benefit from the opportunities of sustainable, green growth



ADVICE

Government Advice

Providing cutting-edge policy advice and insights on the transformation of markets

Business Advice

Helping businesses capture the opportunities in a sustainable low carbon world

Public Sector Advice

Enabling the public sector to cut costs and emissions

FOOTPRINTING

Measuring

Understanding the environmental impact of an organisation, product or service

Certifying

Providing independent verification of organisational or product footprints to endorse sustainable leadership



TECHNOLOGY

Implementation and Finance

Providing expertise and support to businesses to put energy efficiency plans into action

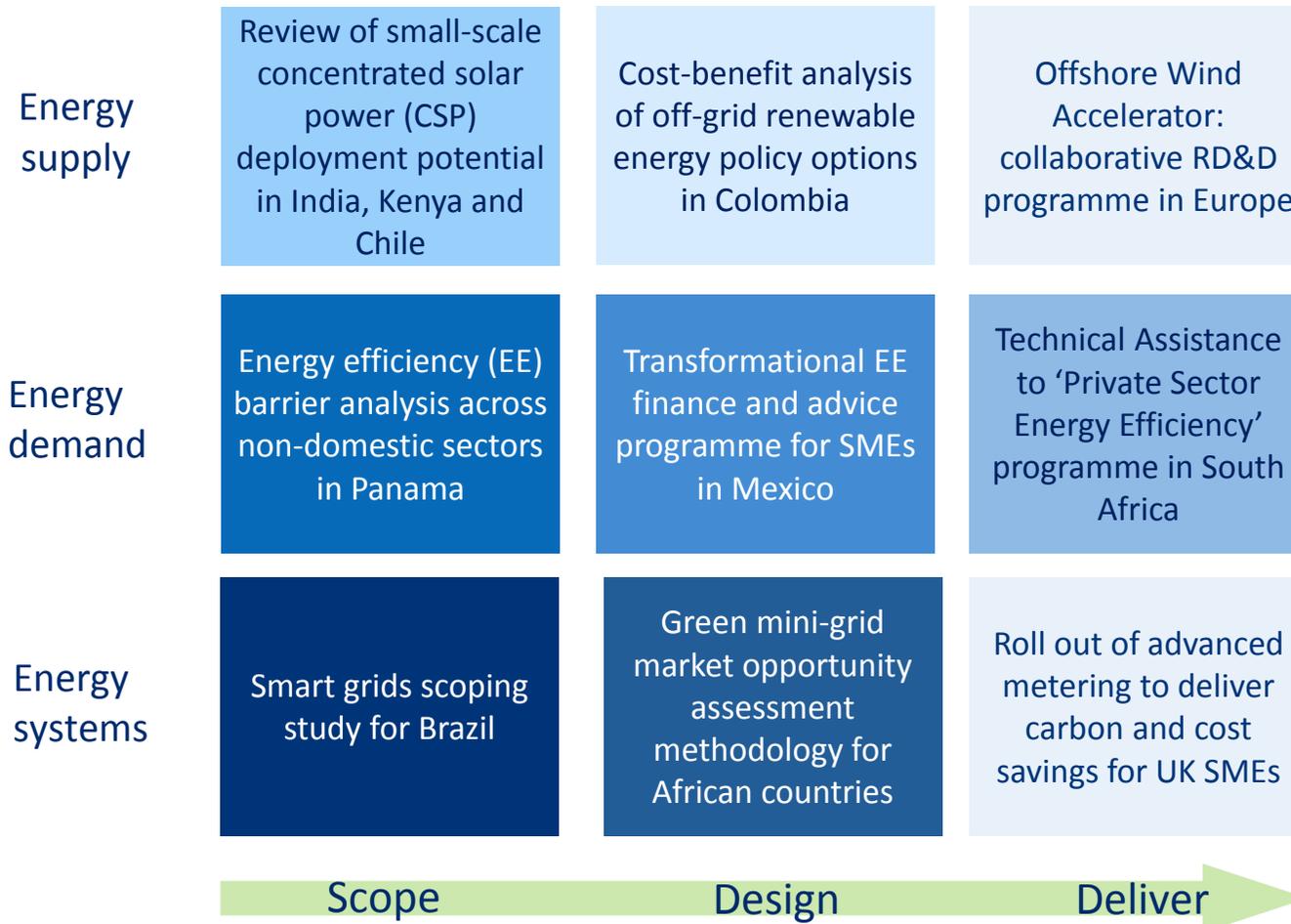


Innovation

Partnering with companies and governments seeking to create value from the clean technology revolution

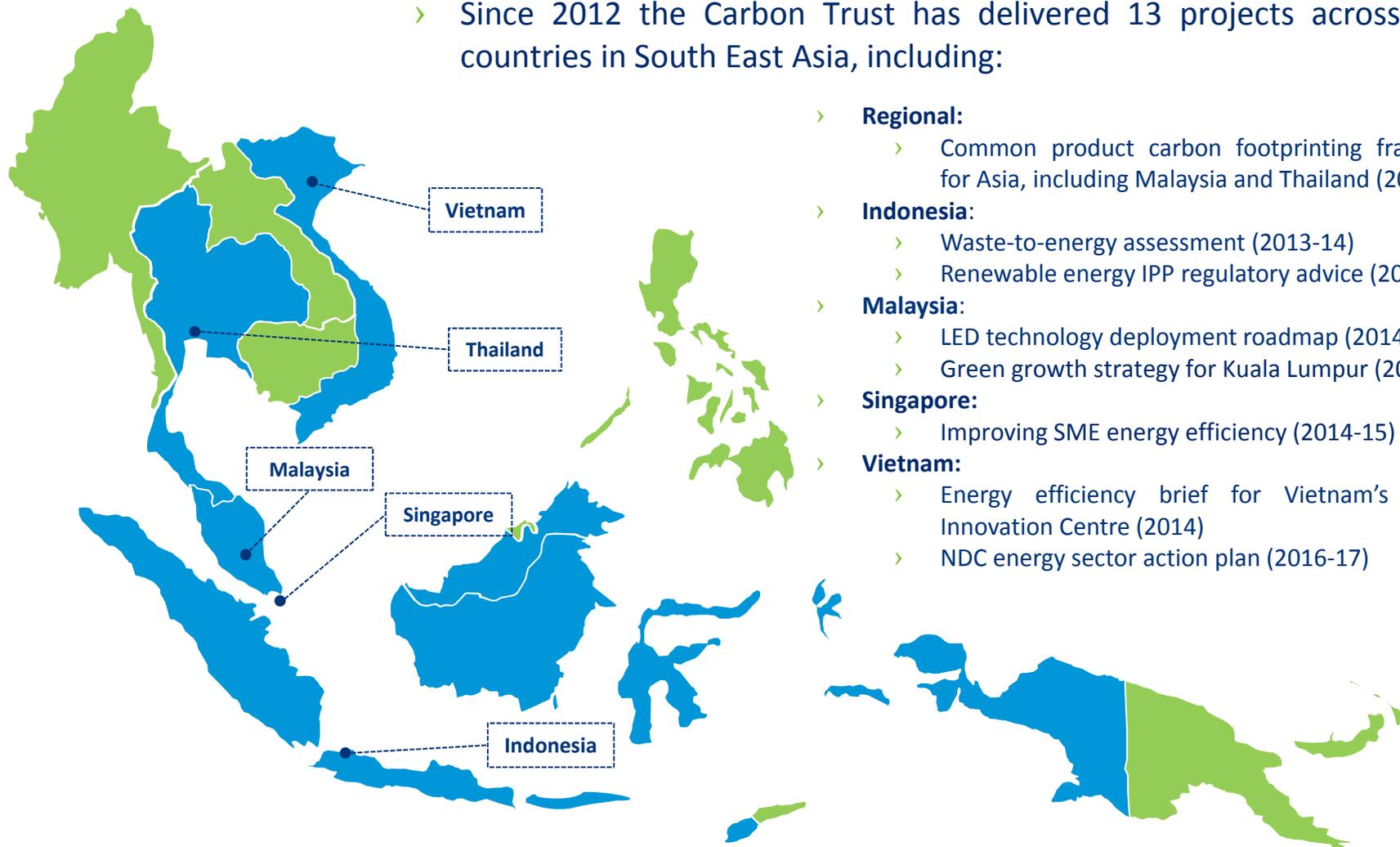


We provide technical assistance from scoping through to delivery



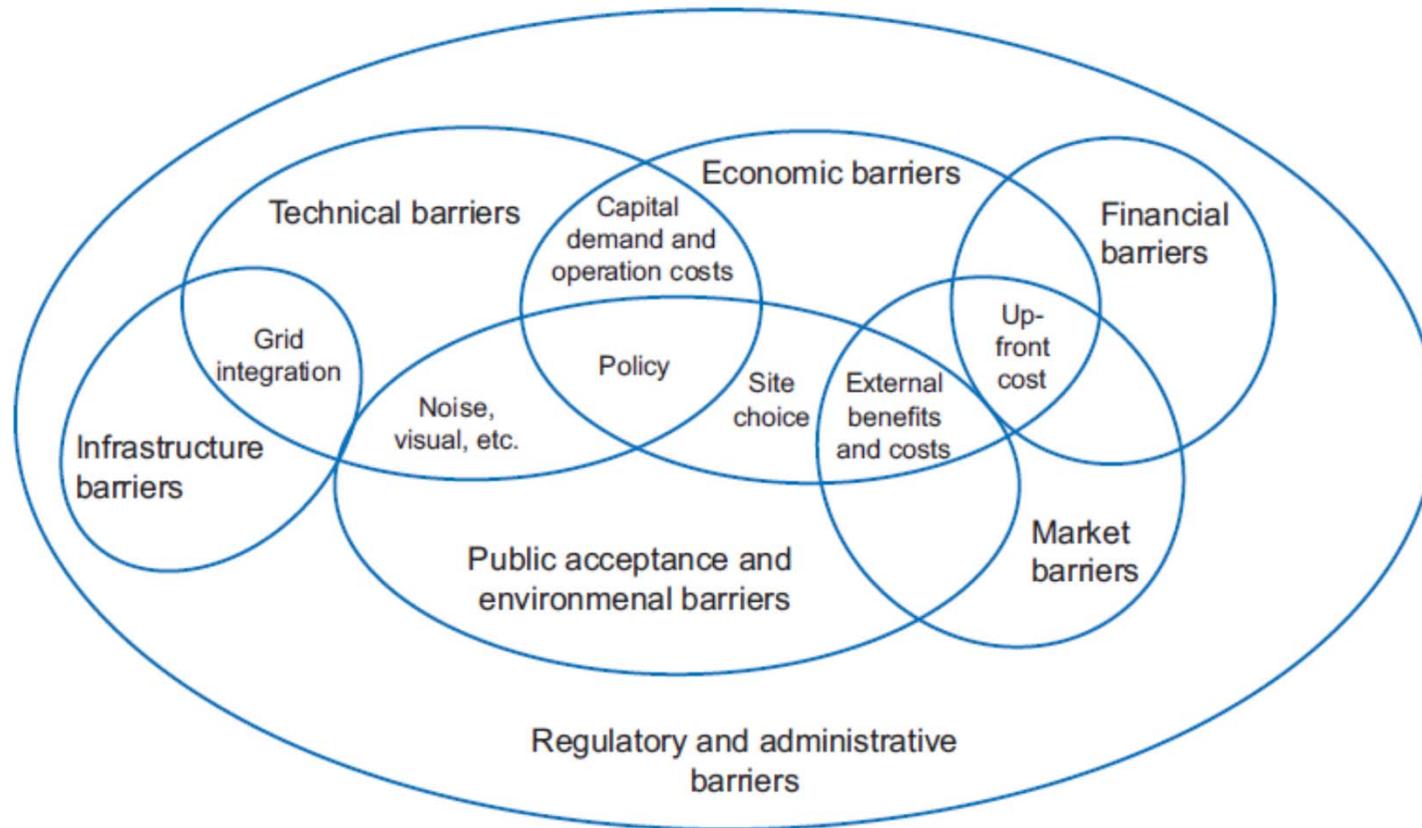
We are working across South East Asia

- › Since 2012 the Carbon Trust has delivered 13 projects across five countries in South East Asia, including:

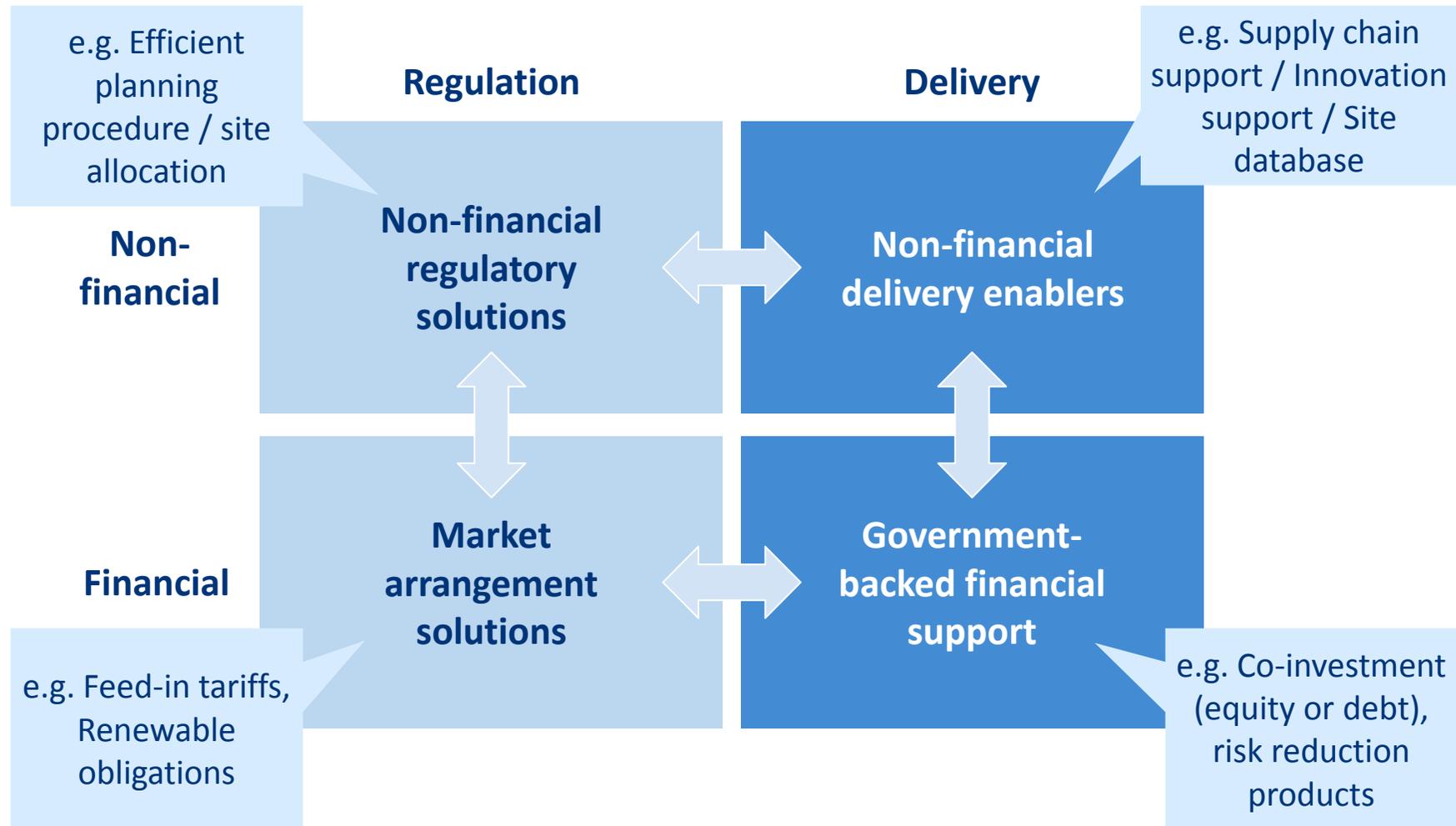


- › **Regional:**
 - › Common product carbon footprinting framework for Asia, including Malaysia and Thailand (2015-16)
- › **Indonesia:**
 - › Waste-to-energy assessment (2013-14)
 - › Renewable energy IPP regulatory advice (2016-17)
- › **Malaysia:**
 - › LED technology deployment roadmap (2014-16)
 - › Green growth strategy for Kuala Lumpur (2016-17)
- › **Singapore:**
 - › Improving SME energy efficiency (2014-15)
- › **Vietnam:**
 - › Energy efficiency brief for Vietnam's Climate Innovation Centre (2014)
 - › NDC energy sector action plan (2016-17)

Key barriers to renewable energy deployment



Potential solutions to overcome barriers and to drive renewable energy investment



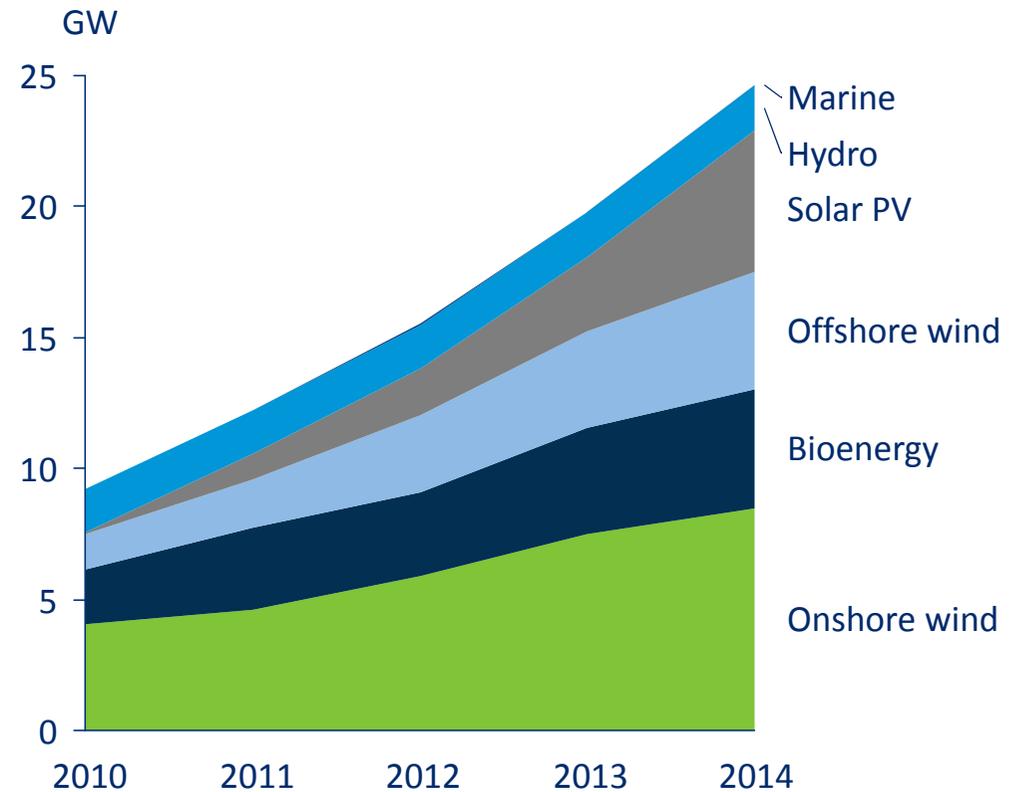
UK support mechanisms have driven RE capacity



UK renewable energy policies – market incentives

Policy	Technologies targeted
Contracts for Difference	Large scale renewable electricity
Feed-in Tariffs	Small scale renewable electricity (<5MW)
Renewable Heat Incentive	Renewable heating / cooling
Renewables Obligation	Renewable electricity (now superseded by CfDs)

UK renewables capacity, 2010-2014



Sources: Department of Energy and Climate Change, UK renewable energy roadmap; IEA, IEA/IRENA Joint Policies and Measures Database; DECC, DECC DUKES 6.4

UK experience with supporting regulatory frameworks for renewables

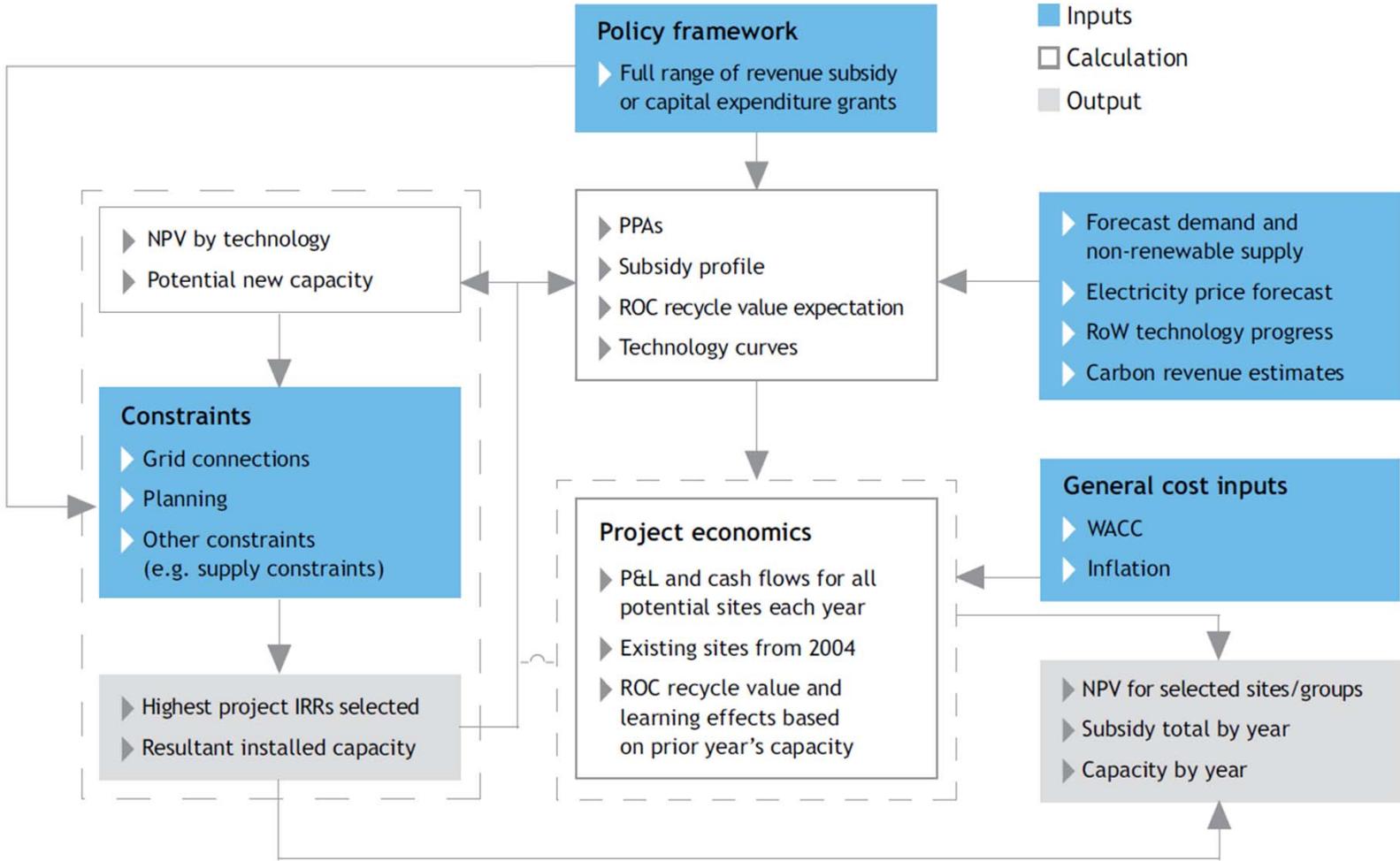


- › Carbon Trust support to the UK government on RE policy framework:
 1. Analysed alternative support frameworks and policies to identify the best option for meeting renewables targets cost-effectively
 2. Developed an action plan to remove key barriers preventing the UK from meeting its 2020 RE target, focusing on offshore wind
 3. Identified government-backed financial interventions to bridge the financing gap for offshore wind in the UK

We evaluated the effectiveness of alternative policy support frameworks for renewables



> A range of inter-dependent factors influence cost and extent of deployment



Source: Policy Frameworks for Renewables, Carbon Trust

We advised the UK government on the most cost-effective policy support frameworks for renewables



- › Analysis of the effectiveness of the UKs' Renewables Obligation Certificates (ROCs) - a system of Renewable Energy Portfolio Standard - versus other incentive mechanisms, such as feed-in tariffs

- › The analysis highlighted how policy design flaws impacted deployment:
 - ROCs designed to pull through cheapest technologies first – not closing the funding gap for higher cost technologies
 - ROCs passed regulatory risk to private sector, which is priced at a premium resulting in a leakage of the subsidy away from developers

- › In response the UK government:
 - Revised ROCs so different technologies received varying levels of support
 - Introduced feed-in tariffs through Contracts for Difference, with ROCs closed to new generation by 2017

We provided recommendations to overcome the barriers facing offshore wind in the UK



- › The key recommendations to the UK government focused on:

Site allocation

Grid and planning regulations

Incentive mechanisms

Technology and supply chain

We developed an action plan, assigning roles and responsibilities to overcome key barriers



Area	Recommendation	Incremental benefit	UK Government				Transport	Treasury	Number 10	Scottish Exec.	RDAs	Crown Estate	Developers	Supply Chain	Other Stakeholders	Ofgem
			DECC	MOD	DIUS	DCLG										
1. Site allocation	Make the most economic offshore wind farm sites available for development	Reduce capex up to £16bn	•	•			•	•	•	•		•	•		•	•
2. Grid & planning regulations	Share grid capacity and change criteria for determining network reinforcement	Up to £2bn capex (onshore)	•					•	•						•	•
	Undertake upfront grid investment in advance of demand	Reduce leadtime by up to 5 years	•					•	•						•	•
	Develop interconnector business case and Europe-wide interconnection regulations	Reduce balancing costs from 15% of total wind costs	•					•	•	•		•	•			•
	Implement full IPC recommendations	Reduce lead time by 2-5 years	•			•		•	•						•	•
	Provide strong NPS for renewables and grid	Reduce lead time by 2-5 years	•	•		•		•	•	•		•	•	•	•	•
3. Incentive mechanism	Modify the RO or change to a 'Stepped feed-in tariff'	Reduce public funding by up to £15bn ¹	•					•	•		•	•	•	•	•	•
4. Technology & supply chain	Invest up to £0.6bn in public RD&D funding in the UK	Catalyse £0.6-£1.2bn in private UK RD&D Reduce capex by up to £15bn ²	•					•	•			•	•	•	•	
	Provide testing facilities, demonstration sites	Increase jobs from 40k to 70k	•					•	•	•	•	•	•			
	Skill development	Increase annual revenues from £6bn to £8bn	•		•			•	•	•		•	•			
	Ports and infrastructure		•					•	•	•	•	•	•			

We advised the Government of Colombia on effectiveness of renewable energy support mechanisms



- › Colombia's national Mining and Energy Planning Unit (UPME) requested an evaluation of the impact of proposed tax incentives on profitability of different renewable energy technologies
- › We explored the costs and benefits of support mechanism on:
 - › Financial cost / benefit of incentives
 - › Impact on project IRR
 - › Project payback period
- › We assessed effectiveness and calculated savings from avoided externalities
 - › Biomass profitable without incentives
 - › Biogas profitability dependent upon incentives
 - › Incentives insufficient to make utility scale solar profitable
 - › Cost of support outweighed by savings from avoided social & environmental costs

We are just starting to work in Vietnam



- › **Project title:** Developing the business case for priority policies and measures to drive energy sector mitigation as part of Vietnam's INDC
- › **Project purpose:** To support the Government of Vietnam to accelerate the implementation of the priority energy sector actions of its Intended Nationally Determined Contribution (INDC) ahead of 2020 by outlining an implementation strategy for key measures that drive renewable energy and energy efficiency.
- › **Project period:** June 2016 – March 2017
- › **Project support:** UK Foreign and Commonwealth Office (FCO)
US National Renewable Energy Laboratory (NREL)



Overview of Vietnam’s existing renewable energy policy framework



	Regulation	Delivery
Non-financial	<ul style="list-style-type: none"> Standardised PPAs (wind, biomass) 	<ul style="list-style-type: none"> R&D programmes (early stage) – e.g. High Tech Parks
Financial	<ul style="list-style-type: none"> Avoided cost tariffs (Biomass, small hydro) Feed-in tariffs (CHP biomass, waste-to-energy, wind) 	<ul style="list-style-type: none"> Tax exemptions Land use / lease fees waived (depends on location) Training for commercial banks Preferential loans of up to 80% of project cost

Indicative – not exhaustive

Source: Interviews with MOIT and other key stakeholders; Support mechanisms for RE development in Viet Nam, GIZ; Decision 32/2012/TT-BCT, MOIT; Investment incentives for RE in SE Asia: Case study of Viet Nam, IISD

Potential policies to accelerate renewable energy deployment in Vietnam



	Regulation	Delivery
Non-financial	<ul style="list-style-type: none"> Streamlined planning procedure Standardised PPAs (for all technologies) Prioritised grid connection Net metering Wheeling regulation 	<ul style="list-style-type: none"> R&D and pilot projects Technical standards and norms Capacity building Supply chain development
Financial	<ul style="list-style-type: none"> Renewable Energy Portfolio Standard Feed-in tariffs <ul style="list-style-type: none"> Solar Carbon pricing / fossil fuel levy 	<ul style="list-style-type: none"> Sustainable Energy Promotion Fund (TBD) Loan guarantees Further loans / grants to assist with up-front costs/feasibility studies

Indicative – not exhaustive

Source: Prime Minister Decision No.2068/QD-TTg November 2015, Renewable Energy Development Strategy; Greening the Power Mix, UNDP; Interviews with MOIT and other key stakeholders



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