

Pre-DIREC Renewable Energy Stakeholder Consultation Report



Prepared for the



सत्यमेव जयते

**Ministry of New and Renewable Energy
Government of India**

by



renewable
energy
& energy
efficiency
partnership

Table of Contents

Key Findings.....	1
Executive Summary.....	3
1. Introduction.....	5
2. Methodology.....	6
2.1 The Questionnaire.....	7
3. Results.....	8
General	
3.1 Question 1	8
3.2 Question 2.....	10
3.3 Question 3.....	12
3.4 Question 4.....	14
3.5 Question 5.....	16
Market Barriers	
3.6 Question 6	18
3.7 Question 7.....	21
3.8 Question 8.....	23
Policy and Regulation	
3.9 Question 9	25
3.10 Question 10.....	28
Business and Finance	
3.11 Question 11.....	30
3.12 Question 12.....	32
4. Summary and conclusions.....	34
Appendices	
A: Stakeholder Questionnaire.....	36
B: Respondents by organisation.....	38
C: Respondents by country.....	43

List of tables and charts

Table 1: Respondent Profile by Region.....	6	Chart 7a: Ease of access to types of information needed?.....	21
Chart 1a: Perceived renewable energy resources with the most potential.....	8	Chart 7b: Ease of access to types of information needed? - by region.....	22
Chart 1b: Perceived renewable energy resources with most potential-by region..	9	Chart 8a: Is there sufficient human capacity to support widespread adoption of renewables?.....	23
Chart 2a: Renewable energy technologies perceived most appropriate.....	10	Chart 8b: Is there sufficient human capacity to support adoption of renewables? - by region.....	24
Chart 2b: Renewable energy technologies perceived most appropriate–by region..	11	Chart 9a: Government policies perceived most effective to promote renewable energy.....	25
Chart 3a: Most needed energy services that renewable energy perceived able to deliver	12	Chart 9b: Government policies perceived most effective - by region.....	26
Chart 3b: Most needed energy services renewable energy perceived able to deliver - by region.....	13	Chart 10a: Perceived most effective regulatory instruments to promote renewables.....	28
Chart 4a: Renewable energy technology perceived most suited to expand energy access.....	14	Chart 10b: Perceived most effective regulatory instruments to promote renewables - by region.....	29
Chart 4b: Renewable energy technology perceived most suited to expand energy access–by region.....	15	Chart 11a: Key business model perceived to offer best potential	30
Chart 5a: Institutions perceived most critical to driving the renewable energy transition.....	16	Chart 11b: Key business model perceived to offer best potential - by region.....	31
Chart 5b: Institutions perceived critical to driving the renewable energy transition - by region.....	17	Chart 12a: Main perceived source for the financing of renewable energy technologies.....	32
Chart 6a: Major perceived barriers to the widespread adoption of renewable energy.....	18	Chart 12b: Main perceived source for the financing of renewable energy technologies - by region.....	33
Chart 6b: Major perceived barriers to widespread adoption of renewable energy-by region.....	19		

Key Findings

- Governments are perceived to have an absolutely critical role in driving the renewable energy transition.
- There is a perceived absence of effective government policy and regulatory instruments in some regions. Despite this, national policies and government targets for renewable energy are seen as effective policy instruments, and feed-in-tariffs are seen as effective regulatory tools where they are actually implemented.
- Solar technologies are widely seen as the most appropriate for expanding access to energy, and this is the case across all regions.
- There is a wide range of perceived barriers to the widespread adoption of renewable energy. The main ones are high costs, inappropriate incentives, policy uncertainty and capacity constraints – particularly lack of grid connectivity and lack of sufficient human skills.

Executive Summary

232 renewable energy stakeholders around the world were consulted on their perceptions regarding renewable energy's potential, barriers, policy, regulation, business and finance.

Potential

Solar is widely seen to be the renewable resource with the maximum potential, though there are some variations by region. Across all areas, solar technologies are clearly perceived as the best ones for widening access to energy. Respondents believe renewable energy is suited to deliver a wide range of energy services; notably lighting and other electricity services. Governments are seen as the most critical institution for driving the renewable energy transition forward.

Barriers

There is a wide range of perceived barriers to the broad adoption of renewable energy. These range from ones of the financial sort, including high costs and lack of access to finance, to the lack of appropriate government incentives, uncertainty and capacity constraints.

The majority of respondents believe they actually do have access to the types of information needed, although there are a range of areas such as market data and government policies where greater information provision would be useful.

Some 60% believe there is not sufficient human capacity to support the widespread adoption of renewable energy technologies. However, in contrast to the rest of the world, this was not seen as a major issue within North America & Europe.

Among the main suggested areas for improvement are the formalisation of education and training, including professional accreditation, technical and engineering skills, and a broadening of management skills for project planning and financial appraisal.

Policy and Regulation

The distinction between government policy and regulatory instruments is unclear among respondents. The fact that policies and regulatory instruments in some regions had been introduced so recently also limited the evaluations. In policy terms, national energy plans and/or government targets are widely perceived as effective, and their absence is perceived in some regions, particularly Southern Africa and West Africa. Feed-in-tariffs are considered the most effective regulatory instrument, particularly in East Asia and South Asia. In some regions, good regulatory instruments are seen to be lacking, even where effective government policies are in place.

Business and Finance

Whilst governments are perceived critical to drive the renewable energy transition overall, when financing and business models are discussed, many other players are mentioned. Public-private partnerships were named most frequently as the business model with the most potential for advancing renewable energy, though views varied considerably by region. In financing, regional differences are also evident, but overall, there is a strong perceived role for the private sector – companies and commercial banks – alongside public sector sources of renewable energy funding.

1 Introduction

The Renewable Energy and Energy Efficiency Partnership (REEEP) was commissioned by the Government of India's Ministry of New and Renewable Energy (MNRE) to carry out preparatory regional stakeholder consultations for the Delhi International Renewable Energy Conference (DIREC 2010) on 27-29 October 2010.

The aim of the consultation was to take a snapshot of the opinions of key energy stakeholders around the world, particularly to understand what are perceived to be the:

- key renewable resources and technologies
- major market barriers
- important and effective policy and finance mechanisms
- needs for capacity building

2 Methodology

REEEP's International Secretariat worked with its Regional Secretariats to identify the appropriate stakeholders and conduct the questionnaire (see Appendix A) to gather the findings in this report. Some 232 global renewable energy stakeholders were surveyed during June and July 2010 via email, telephone and face-to-face. Each response was categorised into one of seven regions; Latin America & Caribbean, East Asia, South Asia, South East Asia & Pacific, Southern Africa, West Africa and North America & Europe (see Table 1).

Table 1: Respondent Profile by Region

NUMBER OF RESPONDENTS		
REGION	Latin America & Caribbean	33
	Southern Africa	33
	West Africa	40
	South Asia (India)	37
	East Asia (China)	33
	South East Asia & Pacific	34
	North America & Europe	22
TOTAL		232

Respondents were drawn from a range of organisations including government ministries, regulators, energy companies, public utility companies, financial institutions, non-governmental organisations, industry associations and research bodies; the full list is available in Appendix B (by organisation) and Appendix C (by country).

Each respondent received a questionnaire containing 12 questions (see section 2.1) and were encouraged to answer all questions with the exception of North American & European respondents for whom Question 4, regarding access to energy, was removed because of its reduced relevance.

The questionnaire results were compiled by the REEEP International Secretariat and consolidated into this report. It should be noted that most respondents offered more than one answer in their answers, with only a small proportion ranking their choices. For consistency, all responses were counted for each question, except when more than five answers were provided. In this case, the respondent was allocated to the "mixture" or "other" category as appropriate for that question. This method makes the generalising assumption that all responses from an individual warranted equal rank.

The results should be viewed in accordance with the purpose for which they were intended: to provide attendees at DIREC 2010 with an overview and snapshot of the current perceptions of a range of international energy stakeholders on key issues relating to renewable energy and clean development.

2.1 The Questionnaire

General Questions

- 1: What do you see as the **renewable energy resources with the maximum potential** in your country?
- 2: What do you see as the **most appropriate technology** to harness the renewable resources in your country?
- 3: What are the **most needed energy services** you believe renewable energies are best suited to deliver in your country?
- 4: Which renewable energy **technology is most suited to expanding energy access** in your country?
- 5: Which **institution/entity is most critical to driving the transition** to renewable energy in your country?

Market Barriers

- 6: What do you see as the **major barrier to the widespread adoption** of renewable energy in your country?
- 7: As a stakeholder in renewable energy, do you have easy **access to the types of information** you need?
- 8: Is there **sufficient human capacity** with the skills needed to support the widespread adoption of renewable energy technologies?

Policy and Regulation

- 9: Which **government policy** has so far been most effective in promoting renewable energy technologies in your country?
- 10: Which **regulatory instruments** have been most effective in promoting renewables in your country so far?

Business and finance

- 11: Which is the **key business model** offering the best potential for creating thriving renewable energy businesses?
- 12: What do you believe is the **main source for the financing** of renewable energy technologies in your country?

3 Results

General Questions

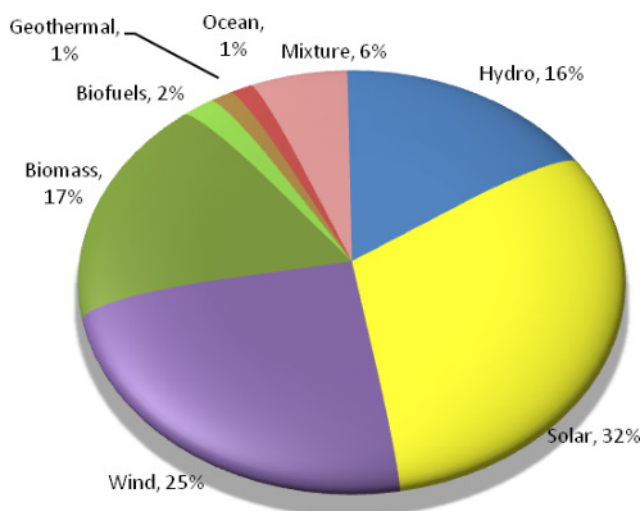
3.1 Question 1

What do you see as the **renewable energy resources with the maximum potential** in your country?

Solar is seen as the renewable energy resource with the maximum potential, particularly in South Asia, Southern Africa, West Africa, East Asia and South East Asia & Pacific, closely followed by wind.

Solar is perceived to be the renewable energy resource with the maximum potential, accounting for 32% of responses, followed by wind with 25%, then biomass and bio fuels (19%) and hydro (16%). Geothermal and ocean resources account for a small proportion. 6% of respondents do not identify there to be one particular source with most potential, and indicate it depends on the availability specific to the local area. These results are presented in Chart 1a.

Chart 1a: Perceived renewable energy resources with the most potential

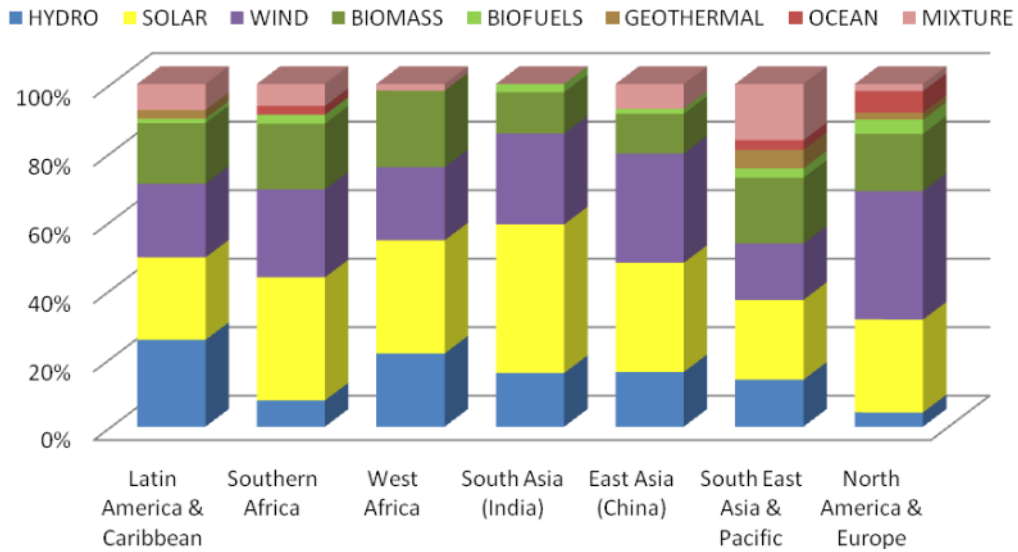


Solar is the perceived resource with maximum potential in five regions accounting for 43% of responses in South Asia, 36% in Southern Africa, 33% in West Africa, 32% in East Asia and 23% in South East Asia & Pacific. In Latin America & the Caribbean, solar is a close second behind hydro power (at 24% and 25% respectively). Wind is identified as the resource with the most potential in North America & Europe at 38%, followed by solar at 27%.

The regional differences, evident in Chart 1b, are likely to be due to two main factors:

- differences in the local climate and environment and thus resource availability, and;
- the extent a resource has already been exploited. For example, hydro has already been largely exploited in North America & Europe and therefore has been identified to have little potential there.

Chart 1b: Perceived renewable energy resources with most potential – by region



3.2 Question 2

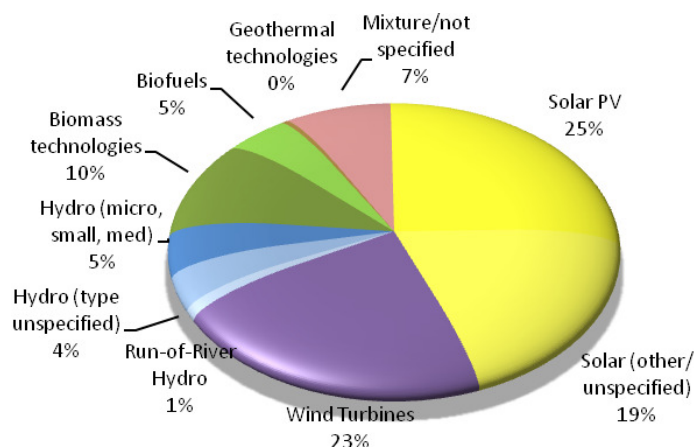
What do you see as the **most appropriate technology** to harness the renewable resources in your country?

Solar technologies are perceived to be most appropriate technology to harness renewable resources in all regions except North America & Europe, where wind technologies are favoured.

It should be noted that some respondents did not appear to differentiate this question from the previous one and repeated their answer for question 1 rather than identifying a more specific technology. All answers were counted and any specific technologies identified were allocated to the appropriate category.

The largest proportion (44%) of responses perceive a form of solar technology to be the most appropriate way of harnessing renewable resources (over half of which specified solar PV), followed by wind turbines at 23% and hydro and biomass, both at 10%. 7% of respondents do not identify one single technology. These results are presented in Chart 2a.

Chart 2a: The renewable energy technologies perceived most appropriate to harness renewable resources



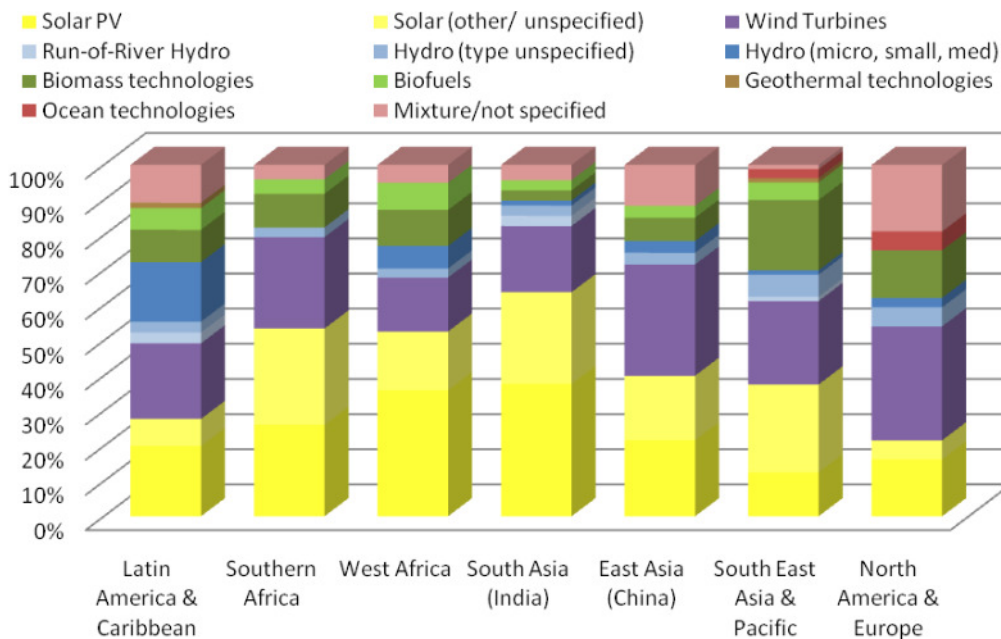
The regional differences are presented in Chart 2b. Solar technologies are identified as the most appropriate renewable energy technology in all regions except North America & Europe. Solar technologies account for over half of responses in three regions: 63% in South Asia and 53% in both Southern Africa and West Africa. The other Asian regions also believe solar to be most appropriate, with wind in second place.

In Latin America & Caribbean 28% identify solar to be the most appropriate technology, closely followed, at nearly a quarter (23%), by hydro technologies. This mostly is attributed to micro, small or medium technologies, but some to run-of-river and large hydro technologies.

In second place in South East Asia & Pacific are biomass technologies, considered by 20% to be most appropriate. This included using wood waste, agricultural residues and biomass combustion techniques.

In North America & Europe, wind turbines are identified by nearly one third (32%) representing the abundant availability and favourable market conditions in that region, followed by solar (21%).

Chart 2b: The renewable energy technologies perceived most appropriate to harness renewable resources – by region



A well-balanced technology mix is specifically perceived as most appropriate by 19% in North America & Europe, 12% in East Asia and 11% in Latin America & Caribbean. The reasons given include the dependency on the resources available in the region, the purpose for which the energy would be used (for example, whether the residential, commercial, industrial or utility market) and the type and scale of technology.

Some respondents also differentiate their answer depending on whether a short-term or long-term time horizon is relevant, reflecting the importance of the maturity level of technologies. For example, ocean technologies are considered more relevant in the long-term in North America & Europe and solar technologies, especially large-scale, are considered most appropriate in the long-term in East Asia, with wind technologies the most appropriate now. A mix of technologies is identified to be an advantage because it enables markets to develop appropriately according to the local resource availability.

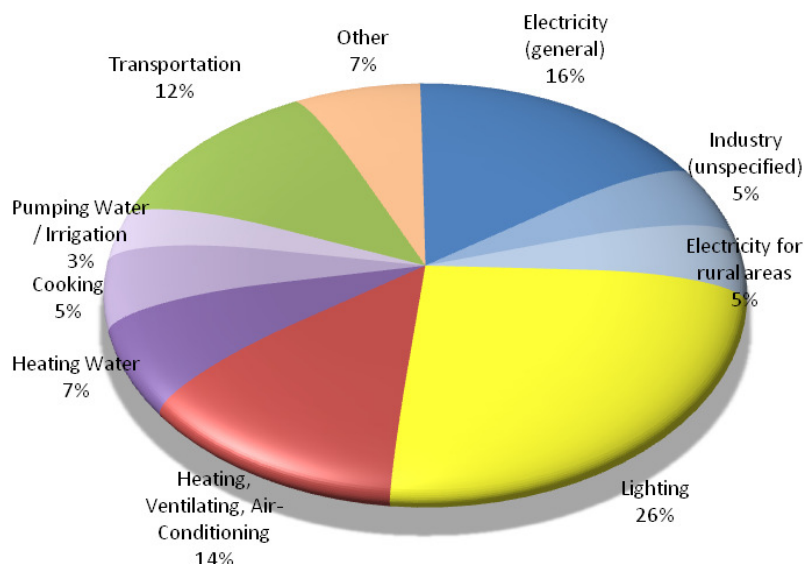
3.3 Question 3

What are the **most needed energy services** you believe renewable energies are best suited to deliver in your country?

Lighting is considered the single most needed energy service that renewable energies are best suited to deliver, along with other electricity services for households, industry and rural areas.

Lighting is specifically considered the most needed energy service that renewable energies could deliver by 26% of those surveyed. Electricity power generation also contributes to, in total, 26% of responses when general, industry and rural components are aggregated. This does not include other electricity driven services where mentioned explicitly. Heating, ventilating and air-conditioning (HVAC) was considered important by 14%, and transportation by 12%. Services in “other” included energy to power communication and computer equipment, for refrigeration as well as non-responses. The results are summarised in Chart 3a.

Chart 3a: Most needed energy services that renewable energy is suited to deliver

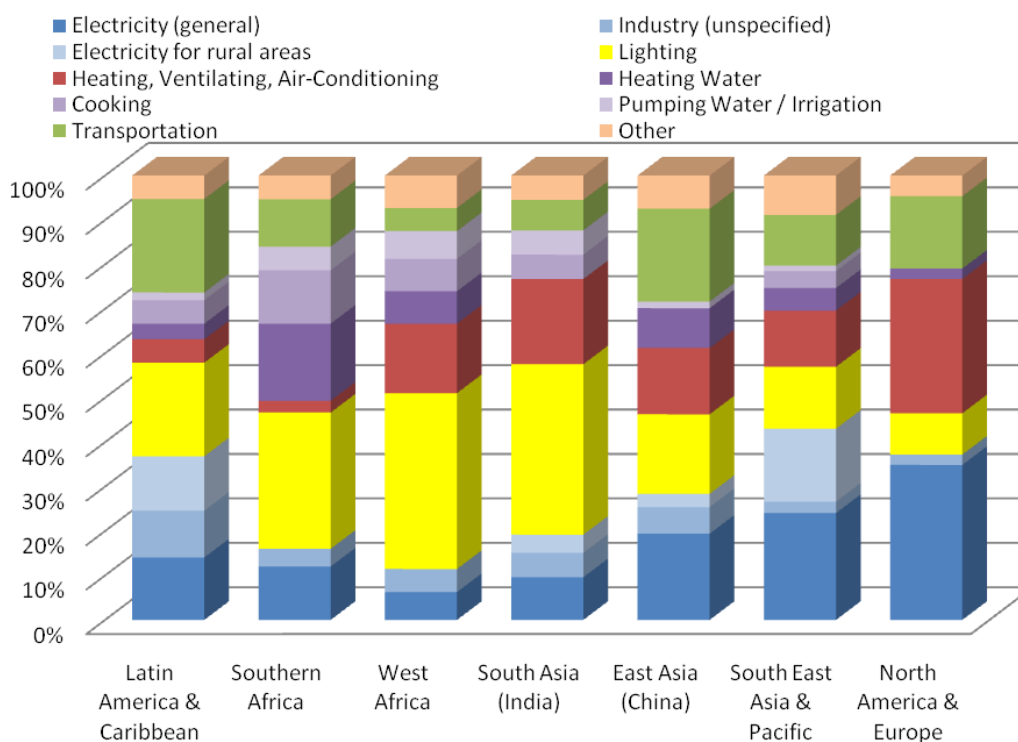


There are differences in the results by region, as are presented in Chart 3b, likely to be caused by local climate conditions, current patterns of renewable resource use and level of development. Among the key differences were:

- Rural electrification is perceived as the most needed energy service by notably larger proportions in South East Asia & Pacific (16%) and Latin America & Caribbean (12%).

- Heating, Ventilating and Air-Conditioning (HVAC) accounts for 30% of responses in North America & Europe but 5% or less in Latin America & Caribbean and Southern Africa.
- Transportation is identified by 21% of responses in Latin America & Caribbean and East Asia and by 16% in North America & Europe.
- Water heating and cooking are identified by the largest proportion in Southern Africa, accounting for 17% and 12% of responses respectively.

Chart 3b: Most needed energy services that renewable energy is suited to deliver – by region



3.4 Question 4

Which renewable energy **technology** is most suited to expanding energy access in your country?

Across all regions, solar is widely viewed as the renewable energy technology most suited to expanding energy access.

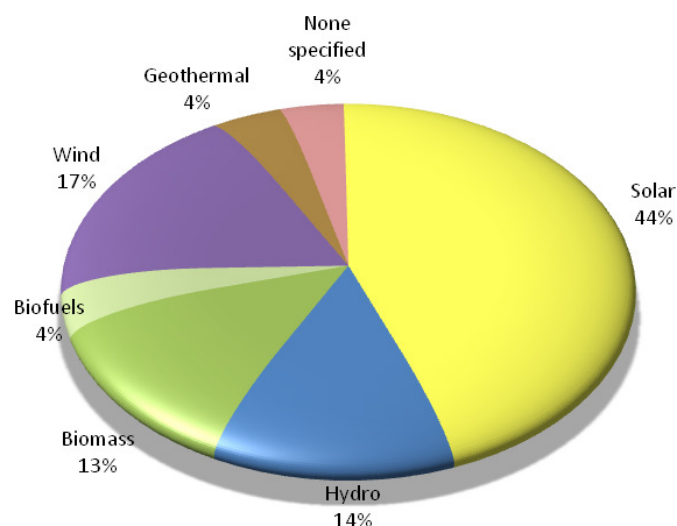
Solar technologies are clearly the renewable energy technology considered most suited to expanding energy access, accounting for nearly half (44%) of responses. It is worth noting that many of these specifically identified photovoltaic (PV) technologies to be the most appropriate (for example, nearly half in Southern Africa).

Wind technologies account for 17%, followed by hydro (14%) then biomass (13%).

A small proportion (4%) of respondents is unable to specify a suitable technology. This group includes those who did not answer the question and those who specified that it was not possible to name just one single technology (because, for example, it depends on the local environment).

These results are presented in Chart 4a.

Chart 4a: Renewable energy technology perceived most suited to expanding energy access*



**question not posed in North America & Europe*

The perception that solar technologies have an important role in expanding energy access is emphasised in all regions. Whilst there are differences by region, presented in Chart 4b, solar technologies account for the largest proportion of responses in all regions; the majority in Southern Africa (59%), South Asia (55%) and West Africa (51%), and 38% in East

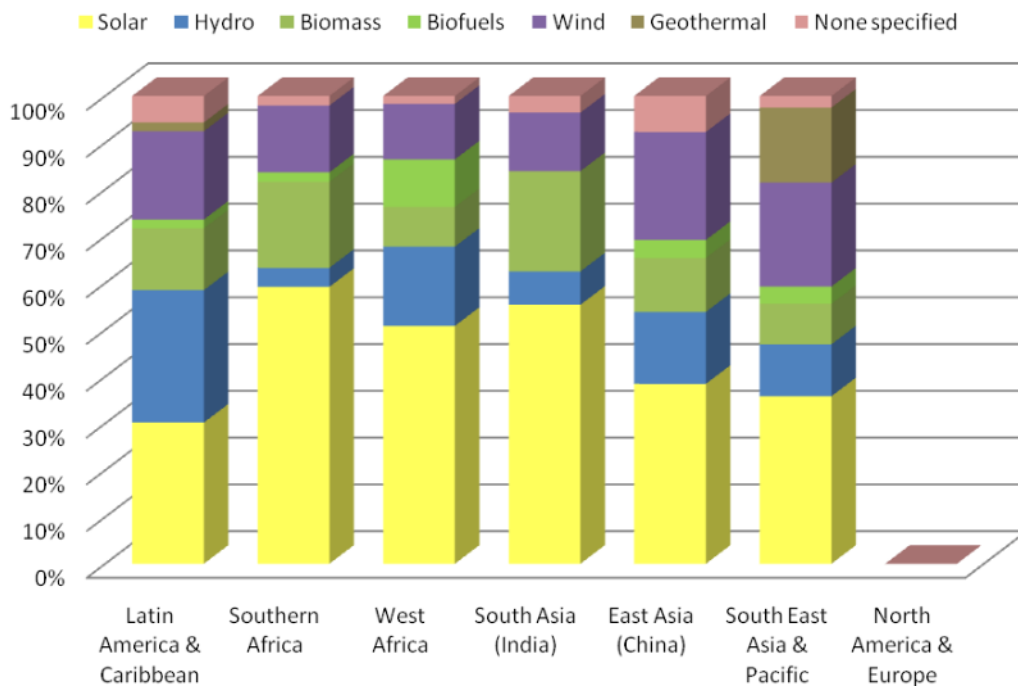
Asia and 26% in South East Asia & Pacific. Only in Latin America & Caribbean do solar technologies face close competition where hydro accounted for 28% of responses versus 30% for solar.

Other regional differences of note are:

- Wind is considered to offer the second most suitable technologies to expanding energy access in East Asia and South East Asia & Pacific (with 23% and 22% of responses respectively).
- Biomass is considered to offer the second most suitable technology to expand energy access in South Asia (at 21%) and Southern Africa (at 18%).
- As well as Latin America & Caribbean, hydro technologies are also considered suitable by 17% in West Africa.
- Geothermal technologies account for 16% of responses in the South East Asia & Pacific region, all of which can be attributed to Australian respondents.

It is notable that the South East Asia & Pacific region includes respondents from Australia, who, whilst being a developed country, still widely identified a role for renewable energy to expand access to energy.

Chart 4b: Renewable energy technology perceived most suited to expand energy access – by region



3.5 Question 5

Which **institution/entity** is most critical to driving the transition to renewable energy in your country?

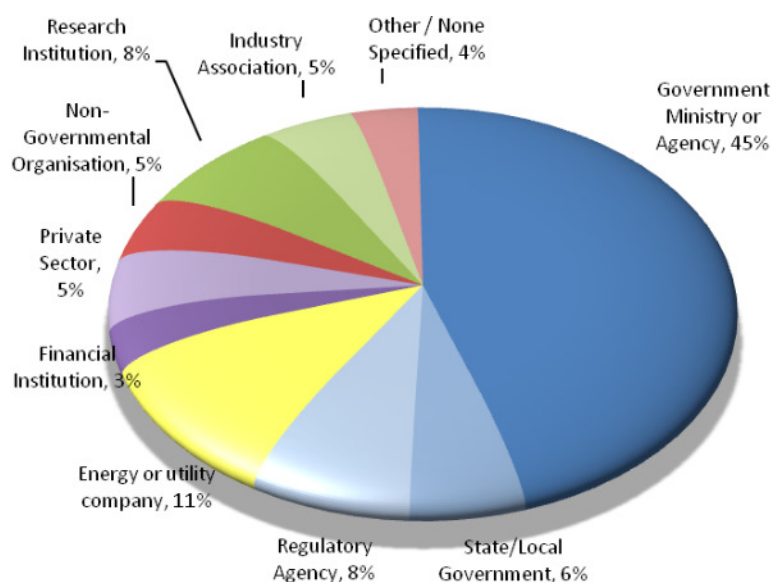
Governments are widely recognised as the most critical institution to drive the transition to renewable energy.

Governments are widely recognised to be the key institution in driving the renewable energy transition, accounting for 59% of responses. The majority of these (45%) specified central government ministries or agencies to be the key institutions. These included energy ministries and other government agencies such as the Indian Renewable Energy Development Agency (IREDA) and South Africa’s Clean Energy Fund.

With 11%, energy and utility companies are in a distant second place although the role of government remains strong because most utilities are controlled directly or indirectly by the state. For example, the public utility Eskom in Southern Africa and the State Grid Corporation of China were specifically identified.

Other institutions considered critical to driving the renewable energy transition are research organisations (8%), non-governmental organisations, industry associations and private sector companies (all 5%). The “Other/none specified” category includes consumers, civil society, local communities and development banks, as well as those respondents who are unable to pinpoint one specific institution.

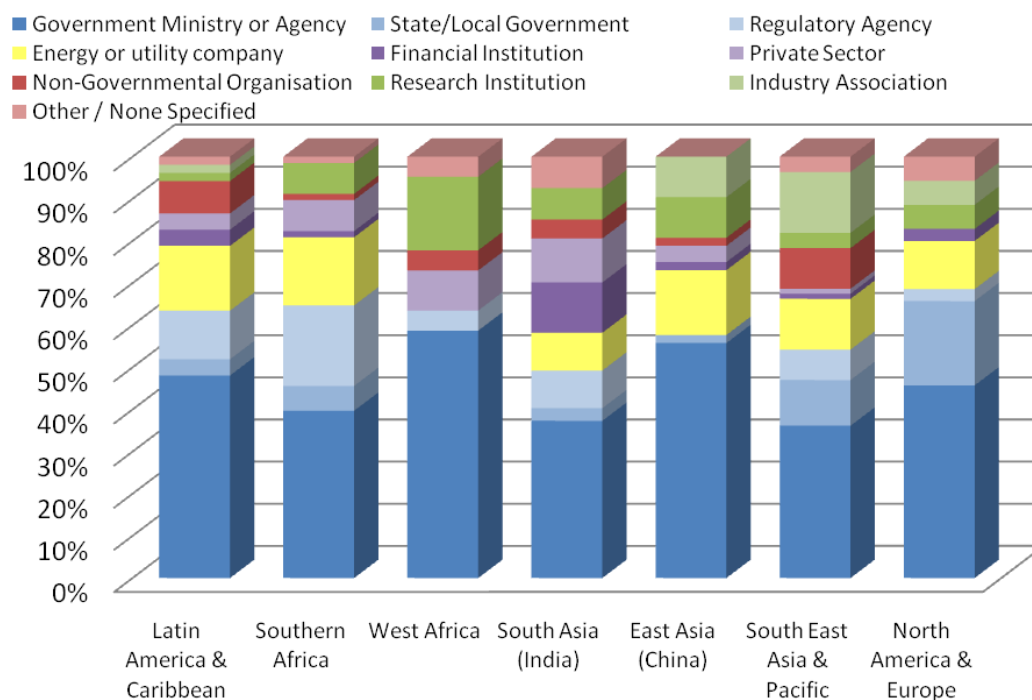
Chart 5a: Institutions perceived most critical to driving the renewable energy transition



The picture is broadly the same across all regions, which can be seen in Chart 5b but some of the differences are:

- Government ministries and agencies are seen as particularly critical in West Africa and East Asia, accounting for 59% and 56% of responses respectively.
- Research institutions are particularly identified as critical in West Africa (by 17%)
- The role for energy and utility companies is perceived particularly strongly in Southern Africa (16% of respondents), Latin America & Caribbean and East Asia (15% in each).
- Non-Governmental Organisations and industry associations are most commonly identified as important in the South East Asia & Pacific region (by 10% and 14% of respondents respectively)

Chart 5b: Institutions perceived most critical to driving the renewable energy transition – by region



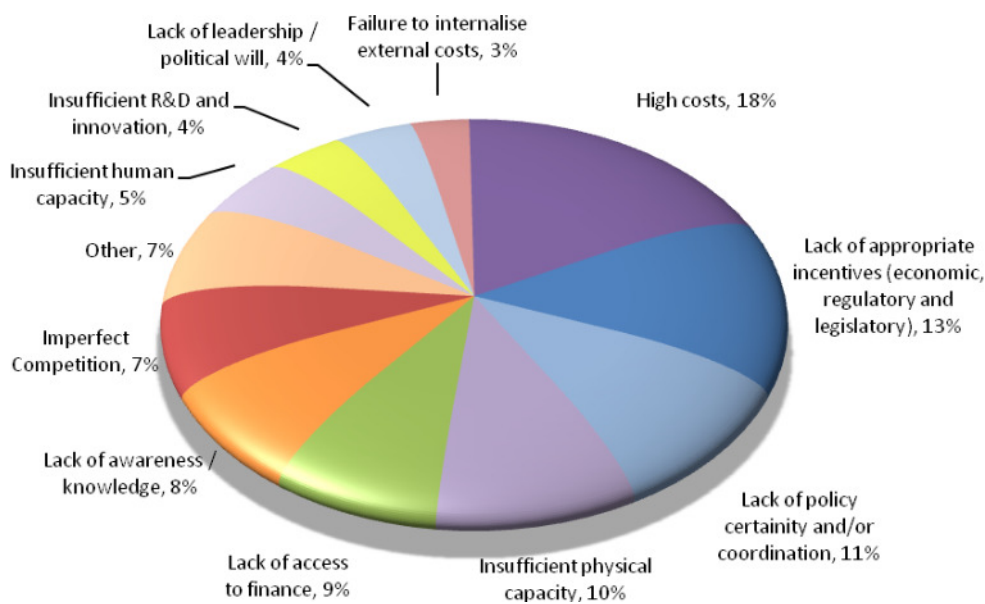
3.6 Question 6

What do you see as the **major barrier to the widespread adoption of renewable energy** in your country?

There is no single major barrier to the widespread adoption of renewable energy. The wide range of barriers perceived include financial barriers (high costs and lack of access to finance), lack of appropriate government incentives, lack of certainty and capacity constraints.

Answers to question 6 produced the most varied number of responses which suggests that a considerable number of barriers exist which differ in scope, scale, and location. Chart 6a summarises the results.

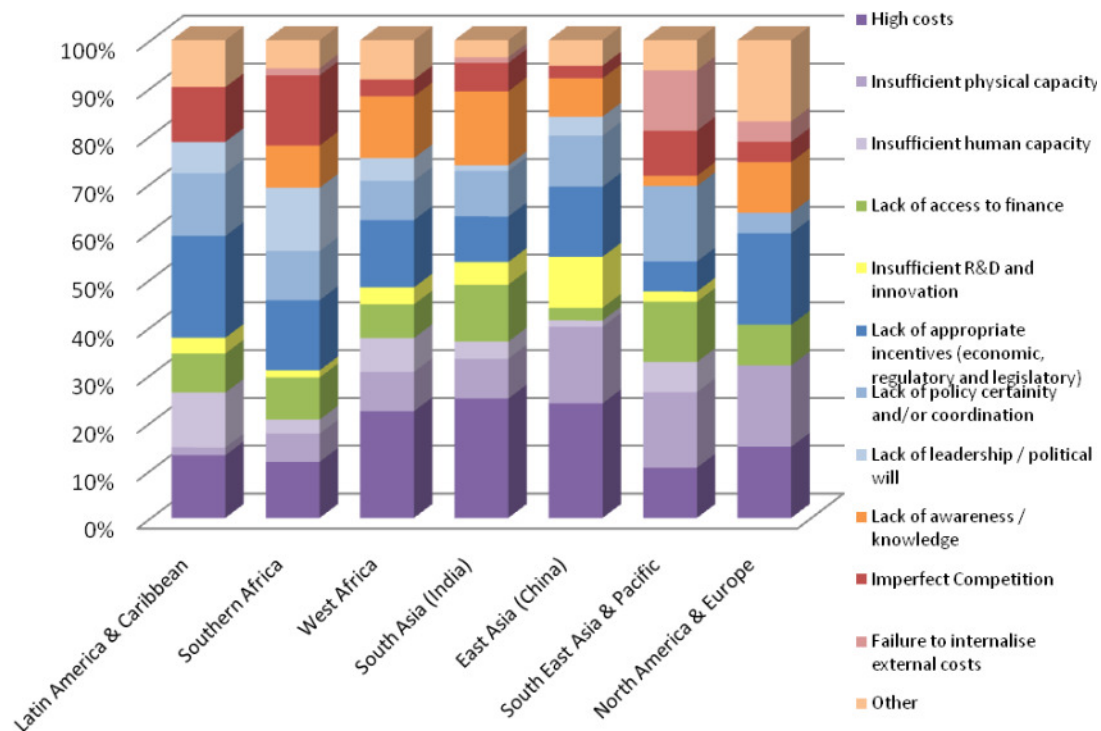
Chart 6a: Major perceived barriers to the widespread adoption of renewable energy



The most commonly reported barrier by 18% of respondents is **high costs** (represented by the dark purple segment in chart 6a). This category received the highest proportion of responses in 3 regions; South Asia (25%) East Asia (24%) and West Africa (22%), and was one of the top three cited barriers in all other regions. Related to this, is the lack of **access to finance**, identified by 9%. As well as high financial costs, external costs are identified to prevent potential investors from accurately appraising projects (3% and notably 13% from the South East Asia & Pacific region). Carbon emissions are the most commonly cited

external cost with the lack of carbon price preventing investors from fully accounting for them.

Chart 6b: Major perceived barriers to the widespread adoption of renewable energy - by region



Three types of government-related barriers are perceived:

- lack of appropriate economic, regulatory or legislative incentives (13%)
- lack of certainty and coordination in policy planning, regulation or legislation (11%)
- lack of political will and leadership (4%)

The **lack of appropriate incentives** included not enough, slow implementation or implementation without the desired outcomes. The lack of appropriate incentives is a particular barrier in Latin America & Caribbean (21%), East Asia (15%), Southern Africa (15%) and West Africa (14%). As well as general inaction, specific examples from these regions included lack of intellectual property protection and quality standards (East Asia), lack of regulation and favourable subsidies (Southern Africa) and lack of legislation to support policies (West Africa). A specific barrier perceived by over half from the developed countries of North America & Europe, is the bureaucratic procedures necessary, for example, to obtain planning permission.

The **lack of certainty** in policy planning, regulation or legislation and lack of strategic coordination is identified by 16% from South East Asia & Pacific and 13% from Latin America

& Caribbean. Uncoordinated oversight is the main reason in South East Asia & Pacific, while in Latin America & Caribbean, it is the short-term approach to policy, regulation and legislation setting.

Four regions identified the **lack of political will** as a barrier, most notably in Southern Africa where this accounted for 13% of responses. Lack of political will is not considered a barrier in South East Asia & Pacific or North America & Europe.

Many kinds of capacity constraints were identified. **Physical capacity constraints** (such as grid connectivity, transportation and communications) are highlighted by 10% and notably in East Asia (16%), South East Asia & Pacific (16%) and North America & Europe (17%). Obstacles to accessing the grid are the key component of the responses from East Asia. In South East Asia & Pacific, grid access as well as other types of infrastructure such as transportation and communication networks are identified as the issue, where planning processes are thought to be a hindrance.

Human capacity limitations are noted by 5%, particularly 11% of Latin America & Caribbean respondents, 7% from West Africa and 6% from South East Asia & Pacific, but not at all by North American & European and East Asian (China) respondents.

Lack of awareness and knowledge on the benefits of adopting renewable energy is identified by 8% globally and includes limited awareness from both potential consumers, producers, governments and financial institutions. Lack of public awareness is the main contributor to this category in South Asia which has the highest number of respondents in this category at 15%. Other contributory factors are cultural (for example, resistance to change in Southern Africa) and misperceptions such as poor reputation of technologies (identified in several regions).

Imperfect competition in energy markets is perceived by 7% of respondents mainly due to the favourable conditions for “incumbents” (producers of non-renewable energy sources). 15% from Southern Africa identify types of imperfect competition such as the public utility monopoly, vested interests in existing energy sources, uncompetitive tendering processes and competitive advantages for incumbents created by artificially low prices for non-renewable energy sources and electricity as factors. Of the 11% of Latin American & Caribbean respondents in this category, the primary reason is favourable incentives for fossil fuels, such as energy subsidies.

Insufficient investment in Research & Development resulting in limited innovation is perceived by 4% and most notably by 11% in East Asia.

The 7% identifying **other** barriers included issues such as intermittency, reliability of new technology and market size.

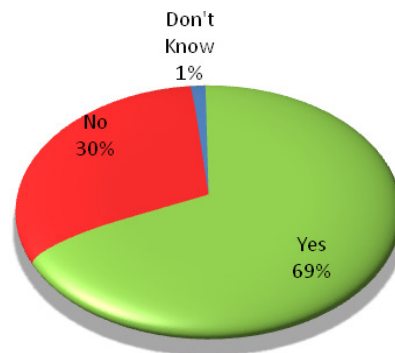
3.7 Question 7

As a stakeholder in renewable energy, do you have easy **access to the types of information** you need?

The majority of stakeholders do believe they have easy access to the types of information they need.

The majority of stakeholders (69%) believe that they have easy access to the types of information they need, as presented in Chart 7a. The 1% in the “Don’t know” category includes non-responses and those who believe it depends on the specific circumstances concerned.

Chart 7a: Easy access to types of information needed?



However, there are notable differences by region, which are presented in Chart 7b. In contrast to the global picture, in South Asia a majority (51%) believe they do not have easy access to the types of information they need followed closely by Southern Africa at 49%. However, the majority in all other regions do believe that they have easy access to the types of information they need; particularly in Latin America & Caribbean and North America & Europe (both 91%).

The types of information needs that respondents identified included:

Data on

- Resources (resource availability and reserves, such as solar radiation maps)
- Technologies (capacity, manufacturing techniques, costs, performance evaluation of existing and proposed systems)
- Renewable energy generation (current, potential and planned)

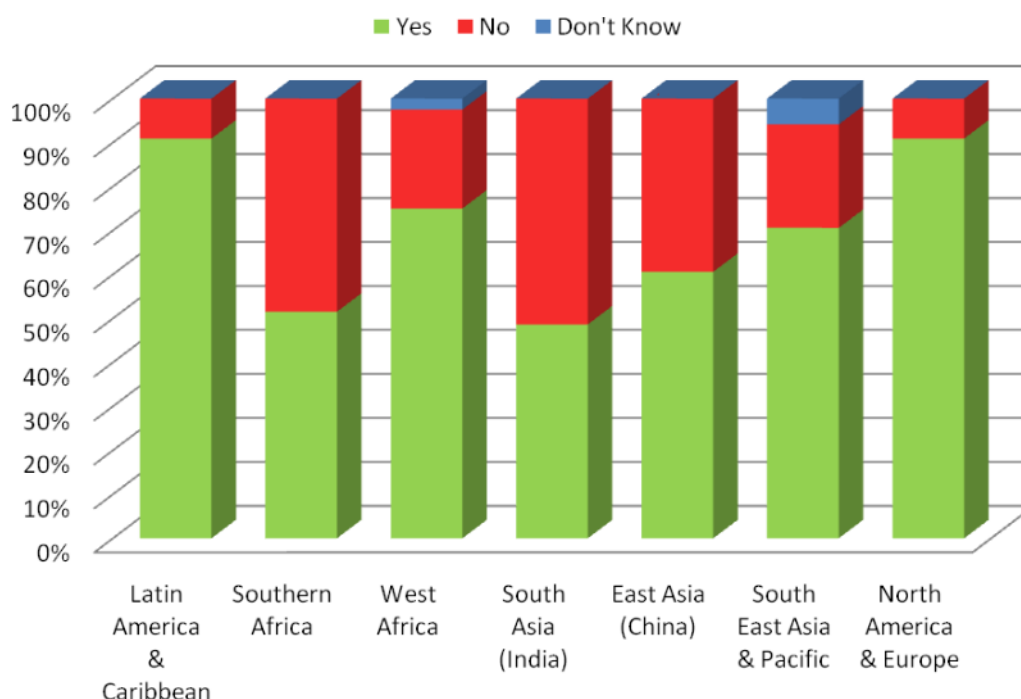
- Grid access and extension plans
- Energy market (supply and demand, distributional analysis, trade balance, future projections)
- Financing mechanisms
- Government investment

Information on:

- Relevant policies (investment/market access incentives, support for SMEs), regulations (technical standards, approval / planning procedures)
- Contact details (renewable energy stakeholders and specific government ministries)
- Funding opportunities
- Tools for project evaluation (such life-cycle analysis)
- Latest scientific research
- Policy evaluations / lessons learnt from other countries

In addition, several respondents call for more standardised, regularly updated data, available in the public domain and a central body or portal through which all the necessary information is made available.

Chart 7b: Easy of access to types of information needed? – by region



3.8 Question 8

Is there **sufficient human capacity** with the skills needed to support the widespread adoption of renewable energy technologies?

Respondents do not believe there is sufficient human capacity with the skills needed to support the widespread adoption of renewable energy technologies. This is the case for all regions except North America & Europe.

The majority of stakeholders (60%) do not believe there to be sufficient human capacity with the skills needed to support the widespread adoption of renewable energy technologies; at 60%. Of the 3% who “don’t know”, this includes non-responses and those which are not universal. Chart 8a presents these results.

Chart 8a: Is there sufficient human capacity to support the widespread adoption of renewable energy technologies?



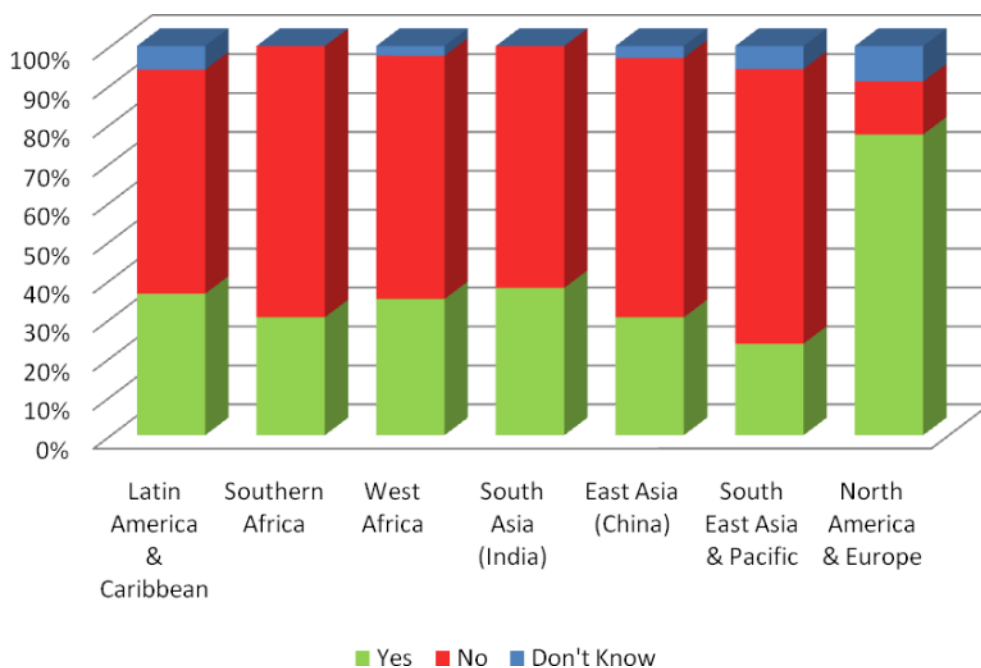
There is a clear difference in perception among stakeholders from the developed countries of North America & Europe where 77% believe there is sufficient human capacity to support the widespread adoption of renewable energy technologies. In all other regions, between 58 and 71% of respondents do not believe human capacity to be sufficient. These results are presented in Chart 8b.

There are a broad range of issues recognised by all as contributing to the constraints in human capacity. These are discussed below.

The need for more **standardised and formal education and training** is recognised. This is thought to be achievable by integrating renewable energy universally into the education system from an earlier stage, as well as by improving the availability of higher education training and professional accreditation. Even advanced economies such as the United Kingdom are still in the process of introducing professional accreditation.

Specific skills perceived to be lacking include not only technical and engineering skills for the design, installation and operation stages but also for after-sales services such as maintenance, as well as broader management skills for project planning and financial appraisal. To achieve this, a mix of practical experience with formal training was considered appropriate. For example, on-the-job training for university leavers as well as retraining existing workers in formal education institutes was identified in South East Asia & Pacific. Similarly, the need for more pilot and demonstration projects is identified in Southern Africa so as to provide workers with the necessary experience.

Chart 8b: Is there sufficient human capacity to support the widespread adoption of renewable energy technologies? – by region



Respondents from all regions except North America & Europe identify that **government skills** in the areas of appraisal, policy development and evaluation could be developed so as to enable the appropriate policy, regulatory and legal structures to be put in place as well as enable strategic coordination and knowledge dissemination.

Other specific issues included:

- a lack of knowledge among governments, consumers and the private market as to the benefits of renewable energy technologies,
- inadequate skills in financial analysis and risk assessment by potential investors,
- inadequate skills and support for entrepreneurial activities and,
- inadequate number of researchers or coordinating approach to enable the adequate level of basic research and development to take place to generate innovation.

Policy and Regulation Questions

Questions 9 and 10 asked respondents to identify the most effective government policies and regulatory instruments introduced to promote renewable energy technologies. When analysing the results two problems were apparent:

1. Respondents did not clearly differentiate between the meanings of “government policy” and “regulatory instrument” resulting in some repetition and overlap between the two questions.
2. The lack of policies or regulation or the fact that measures had not yet been in place for long in many cases, resulted in hypothetical or not evidence-based responses.

Therefore, the results for questions 9 and 10 should be interpreted cautiously.

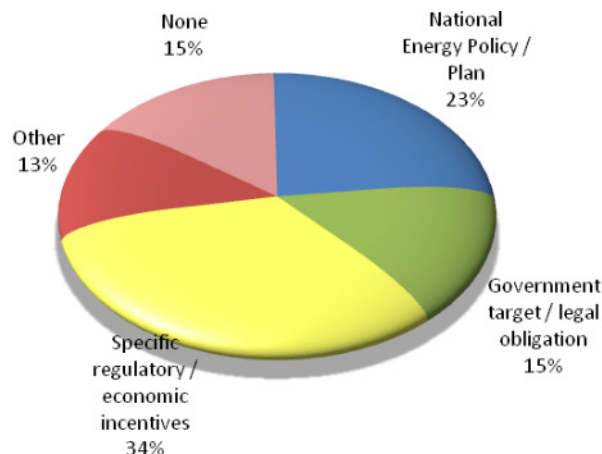
3.9 Question 9

Which **government policy** has so far been most effective in promoting renewable energy technologies in your country?

There is mixed evidence on effective government policies to date although national energy policies and government targets or legal obligations are perceived by some to be important.

Chart 9a shows that nearly a quarter (23%) of respondents identify an **effective national energy plan or policy** in their country and 15% a **government target or legal obligation**. However, 15% identify **no effective government policy** at all.

Chart 9a: Government policies perceived as most effective to promote renewable energy technologies

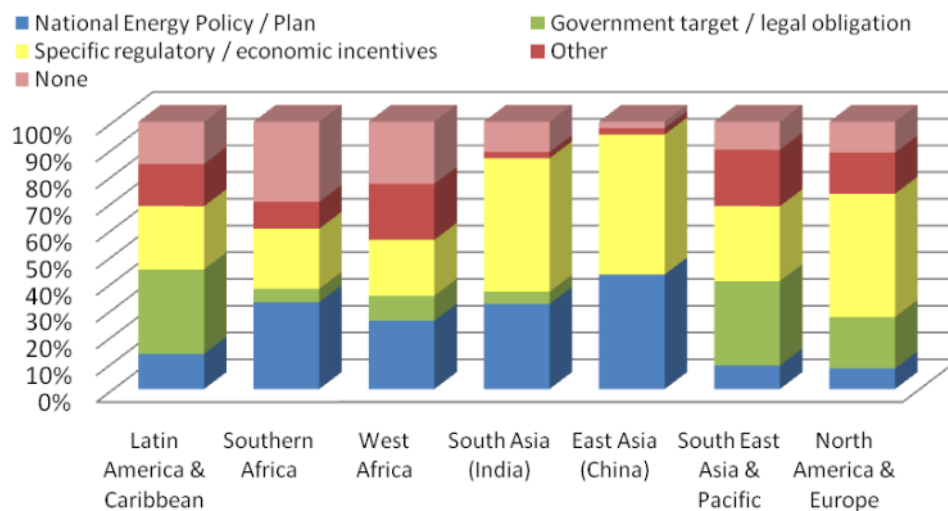


Notable differences by region are evident in Chart 9b. A larger proportion of respondents identify an **effective national energy plan or policy** in East Asia (43%), Southern Africa (33%) and South Asia (32%) than elsewhere, mostly citing China’s Renewable Energy Law, South Africa’s Renewable Energy White Paper and India’s National Solar Mission.

Nearly a third of respondents in Latin America & Caribbean and South East & Pacific specifically identify a **government target** as effective in their country. This includes the Brazilian Incentives Program for Alternative Sources of Electric Energy (PROINFA) in Latin America & Caribbean which involved in its 2nd phase a target of increasing the share of renewable energy to annual consumption to 10%¹ and Australia’s Mandatory Renewable Energy Target (MRET) in South East Asia & Pacific, which sets wholesale purchasers of electricity a legal responsibility to ensure renewable energy is an increasing proportion².

It should be noted that respondents were allocated to a category based on the specific answer provided. Whilst this prevents double counting, it may be that some answers could have been allocated to more than one category. For example, where an identified national energy policy also includes a government target (such as China’s Renewable Energy Law which includes a target that 15% of all energy must come from renewable sources by 2020³) it was not counted in the government target category. Conversely, the policies specified as government targets may have other broader energy policy aims (such as PROINFA) but were not counted in the national energy policy category.

Chart 9b: Government policies perceived as most effective to promote renewable energy technologies – by region



¹ <http://projects.wri.org/sd-pams-database/brazil/programme-incentives-alternative-electricity-sources-proinfa>

² <http://www.orer.gov.au/publications/mret-overview.html>

³ <http://www.efchina.org/FNewsroom.do?act=detail&newsTypeId=1&id=107>

There are also distinct regional differences in those respondents identifying a **lack of effective government policy**, ranging from as few as 2% in East Asia to as many as 30% in Southern Africa and 23% in West Africa.

The 13% of responses in the “other” category include references to government programmes for awareness (in West Africa) or research and development (such as Australia’s Clean Energy Initiative), the establishment of appropriate institutional frameworks or bodies (in West Africa countries), references to policies in support of associated issues such as energy efficiency, poverty reduction and rural electrification and the international Clean Development Mechanism.

The references to specific interventions (such as feed-in-tariffs or tax incentives) in answer to this question about government policies is representative of the problems identified above and therefore should not be considered.

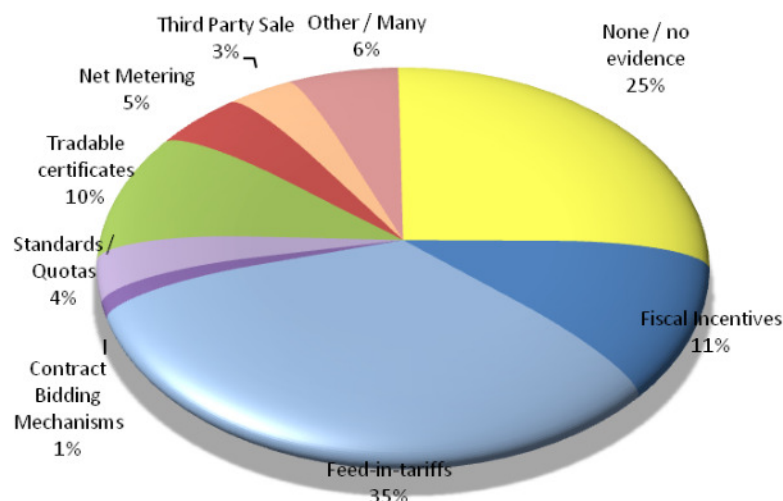
3.10 Question 10

Which **regulatory instruments** have been most effective in promoting renewables in your country so far?

Feed-in-tariffs are widely considered the most effective regulatory instrument in promoting renewables, but the perceived lack of any effective regulatory instruments is also notable in some regions.

Feed-in-tariffs (FITs) are widely considered the most important regulatory instrument, accounting for 35% of responses, as evident in Chart 10a. The next highest proportion of responses (at 25%) is of the opinion that there are **no effective regulatory instruments** to promote renewable energy technologies. This could include newly introduced regulatory instruments on which there is no evidence to date.

Chart 10a: Perceived most effective regulatory instruments to promote renewables



Regional differences are presented in Chart 10b. FITs are the most cited response in all three Asian regions (58% in East Asia, 37% in South Asia and 34% in South East Asia & Pacific) as well as in North America & Europe (36%).

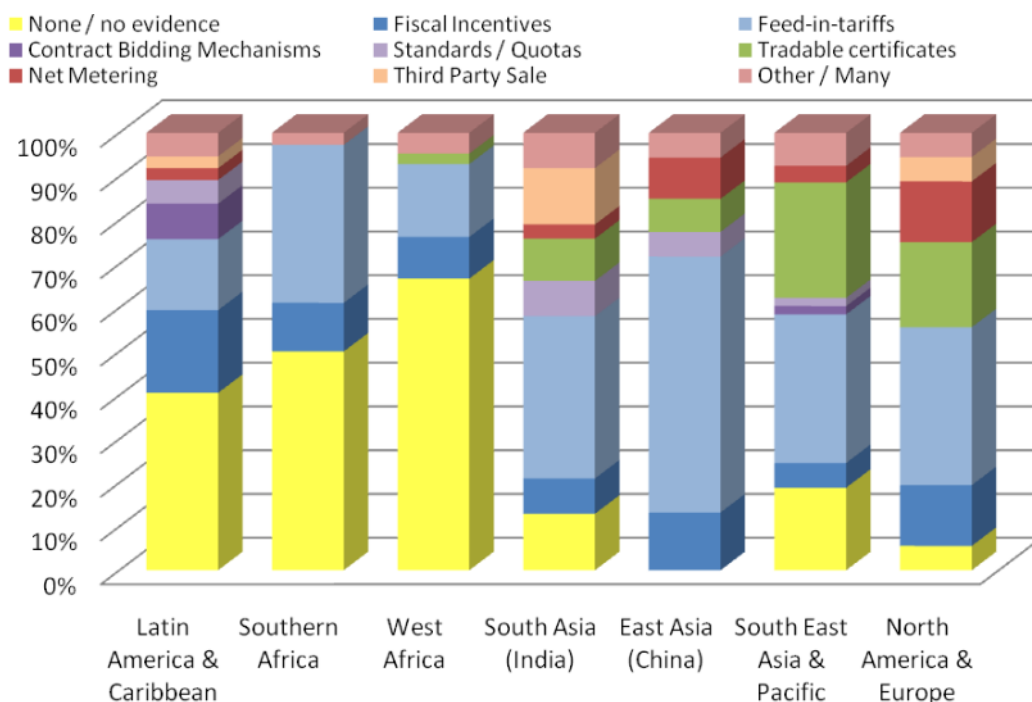
The lack of effective regulatory instruments is particularly evident among the majority of responses from West Africa (67%) and Southern Africa (52%) and a significant proportion in Latin America & Caribbean (41%).

Other regulatory instruments identified include **fiscal incentives** (11%) such as taxes or subsidies, and tradable certificates (10%). Specific fiscal incentives identified include tax exceptions (Latin America & Caribbean), capital or production subsidies (North America &

Europe), accelerated depreciation benefits (South Asia) and investment subsidies (East Asia).

Tradable certificates are identified by the highest proportions in South East Asia & Pacific (26%) and North America & Europe (19%), which can be attributed to the mechanism associated with the renewable obligations set by those governments (identified in question 9).

Chart 10b: Perceived most effective regulatory instruments to promote renewables – by region



Policy and regulation summary

When considering the answers to questions 9 and 10 two main conclusions emerge:

- There is often a lack of government policy and specific regulatory instruments perceived to be effective to support renewable energy.
- Even where there are overall effective government policies in place (such as a national energy plan or government target), there is an absence of effective implementation of regulatory instruments so as to achieve the overarching aim. This is particularly the case in Latin America & Caribbean, Southern Africa and West Africa where a significant proportion (between 41-67%) identify a lack of effective regulatory instruments even though a notable (if smaller at 37-45%) proportion identify effective government policies in answer to question 9.

Business and Finance Questions

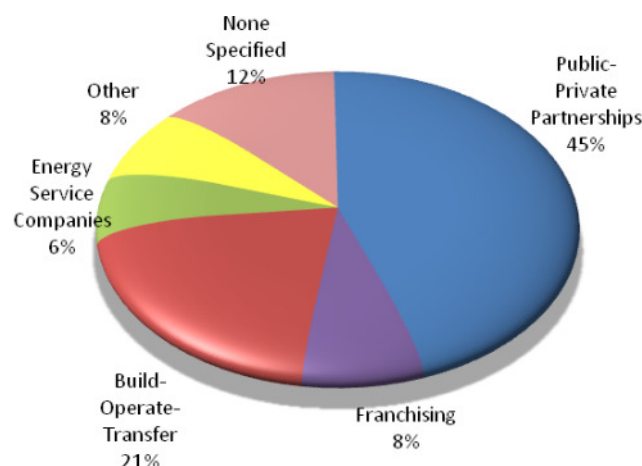
3.11 Question 11

Which is the **key business model** offering the best potential for creating thriving renewable energy businesses?

Public-Private Partnerships were widely perceived as the key business model offering the best potential for creating thriving renewable energy businesses, although not universally.

A significant proportion (46%) of respondents identify the Public-Private Partnership (PPP) model (as presented in Chart 11a) as that offering the best potential for creating thriving renewable energy businesses. However, this global picture hides the regional differences, evident in Chart 11b.

Chart 11a: Key business model perceived to offer the best potential for creating thriving renewable energy businesses

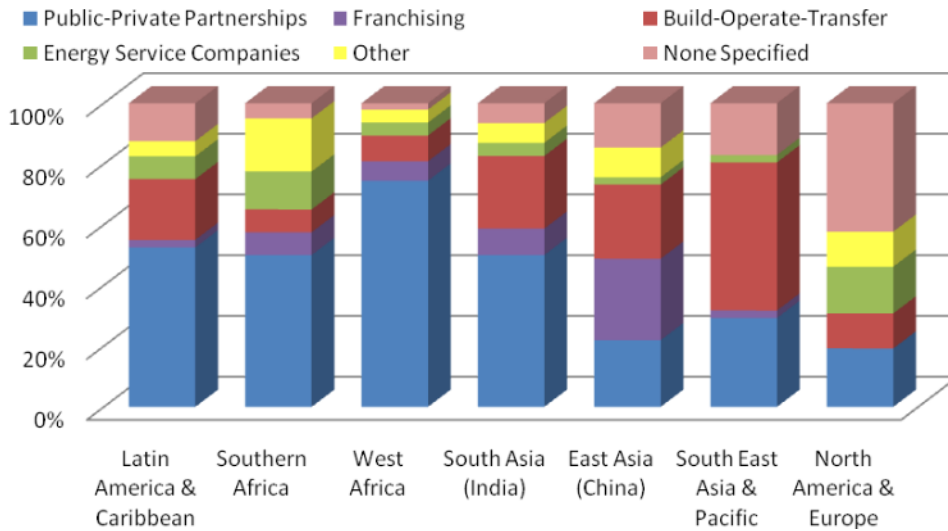


The majority of respondents in four regions identify PPPs to offer the greatest potential for businesses; 75% in West Africa and 50% or more in Latin America & the Caribbean, South Asia and Southern Africa. By contrast, only 30% identified it in South East Asia & Pacific, where nearly half (49%) identify the Build-Operate-Transfer (BOT) model, and only 22% in East Asia where franchising took the highest proportion at 26%, closely followed by BOT (24%).

In North America & Europe there is not one model perceived to offer the greatest potential. 42% do not specify a single model but often indicate that the key model depends on factors such as the technology concerned and the business and political environment.

The “other” category includes responses less commonly cited. These include private ownership or enterprises such as independent power producers (IPPs), direct government funding and sale leaseback schemes. “None specified” includes non-responses and respondents who think a mix of models is appropriate.

Chart 11b: Key business model perceived to offer the best potential for creating thriving renewable energy businesses - by region



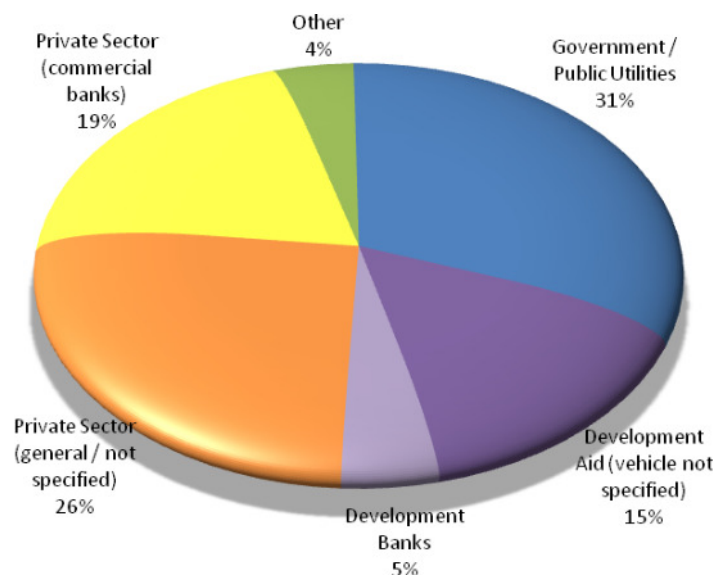
3.12 Question 12

What do you believe is the **main source for the financing** of renewable energy technologies in your country?

There is no one main perceived source for the financing of renewable energy technologies.

There is not one main source for financing of renewable energy technologies perceived by respondents to the stakeholder consultation. 31% identified governments or public utility companies to be the main source for financing, but this is closely followed by general private sector (26%), development aid (though banks or other vehicles) at 20% and commercial banks at 19%.

Chart 12a: Main perceived source for the financing of renewable energy technologies



By region there are clearer distinctions, as evident in Chart 12b.

In East Asia and West Africa, government financing is most strongly perceived as the main source for financing, by 44% and 38% respectively.

Development aid is identified by 34% of respondents from Latin America & Caribbean, Southern Africa and West Africa. In Latin America & Caribbean and Southern Africa responses in this category account for the largest proportion. The proportions are

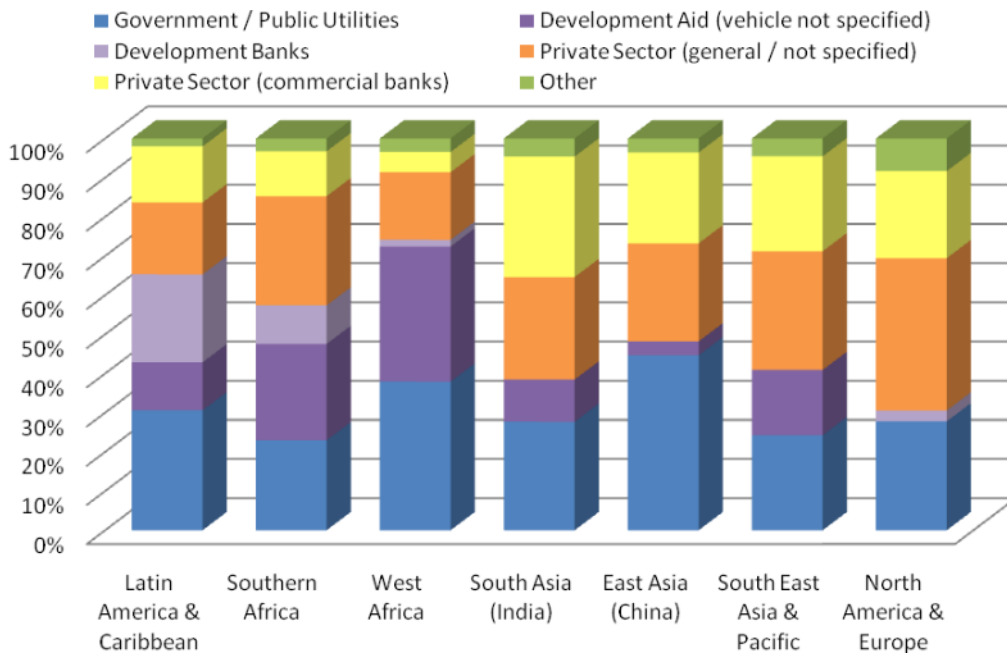
somewhat smaller within Asian regions; particularly South Asia and East Asia at 11% and 4% respectively.

The private sector including commercial banks is perceived to be the main source of financing by the majority in North America & Europe, South Asia and South East Asia & Pacific. In South Asia the single source most specified are commercial banks at 31%.

The “other” category includes initiatives such as community cooperatives and those respondents who thought a combination or all types of financing are suitable.

The lack of consensus over a single financing source that is most appropriate overall and the differences by region suggest that many factors come into play, such as the type of technology to be invested in, maturity of the market, as well as the local economic and investment climate.

Chart 12b: Main perceived sources for the financing of renewable energy technologies - by region



4 Summary and conclusions

As preparation for the Delhi International Renewable Energy Conference in October 2010 (DIREC2010) the Renewable Energy and Energy Efficiency Partnership (REEEP) were asked by the Government of India's Ministry of New and Renewable Energy (MNRE) to consult a range of international renewable energy stakeholders to identify what are perceived to be the:

- key renewable resources and technologies
- major market barriers
- important and effective policy and finance mechanisms
- needs for capacity building.

This report has presented the results from this consultation of 232 international energy stakeholders and provided a general snapshot of current perceptions on these issues.

Potential

Whilst regional differences do exist, solar is globally perceived as the renewable energy resource with the maximum potential. Solar technologies are seen as the most appropriate by far, for expanding energy access. Wind, hydro and biomass are also perceived to be important in some regions, reflecting the local climate and the extent to which resources have already been exploited or technologies brought to market. Renewable energy is seen to be suited to deliver a range of energy services; notably lighting and other electricity services.

Barriers

There is no single major barrier to the widespread adoption of renewable energy. The wide range of perceived barriers includes financial, capacity and government considerations.

Financial barriers include high costs and lack of access to finance which is resulting in insufficient levels of investment and thus capacity constraints – both physical and human. The physical constraints perceived relate primarily to access to the electricity grid. Insufficient human capacity to support the widespread adoption of renewable energy technologies are perceived by 60% (with strong majorities in all regions except North America & Europe). Capacity building is considered necessary in many areas, including the formalisation of education and training, with professional accreditation for technical and engineering skills, the broadening of the required management skills for project planning and financial appraisal, and within government, the ability to appraise and evaluate policies.

Government-related barriers include inappropriate economic, regulatory or legislative incentives which may include not enough incentives, slow implementation or outcomes other than what was desired. Policy uncertainty, lack of strategic coordination and lack of political will are also perceived barriers to the renewable energy transition.

Other perceived constraints include low awareness and knowledge of the benefits of renewable energy technologies among consumers, producers and sometimes governments,

imperfect competition (with favourable conditions, such as pricing mechanisms, for market incumbents) and lack of research and developing to drive innovation.

Although the majority of respondents do believe they have easy access to the types of information needed, there notable exceptions by region. There are a range of areas in which greater information provision would be beneficial such as market data (on resource availability, technology availability, costs and performance) and government policies, the latest research and funding opportunities.

Policy and Regulation

Governments are widely recognised as the most critical institution in driving the renewable energy transition. However, there are unclear views on the most effective government policies and specific regulatory instruments. There is a basic lack of clarity in the distinction between government policy and regulatory instruments in the first place. And for many newly introduced policies and instruments, respondents see little chance to evaluate realistically.

On government policy, whilst the presence of national energy policies and/or government targets is widely perceived as effective, in some regions (particularly, Southern Africa and West Africa) a basic lack is perceived in this area. On regulatory instruments, feed-in-tariffs are widely considered the most effective tools (particularly in East Asia and South Asia), although even where there are effective government policies in place, there may still an absence of effective regulatory instruments.

Therefore, whilst governments are perceived key players and can facilitate business and investment climate through which producers and consumers are able to overcome the barriers they currently face, there is a clear need to achieve this by clear, consistent and long-term policy frameworks supported by well-evaluated regulatory instruments. Greater evaluation and dissemination of policies and instruments across the world is therefore important.

Also, whilst governments are perceived to be key in leading the renewable energy transition, there are many other important players (research institutions, NGOs, industry associations, financial institutions as well as communities and individual consumers) also perceived to have a critical role to play.

Business and Finance

Public-Private Partnerships are seen by most respondents as the best suited business model for promoting renewable energy, although not universally. In financing renewables, the private sector (companies and banks) is perceived to be have an importance equal to the public sector, particularly in North America & Europe, South Asia and South East Asia & Pacific.

Appendix A: Pre-DIREC 2010 Stakeholder Questionnaire



Pre-DIREC 2010 Stakeholder Questionnaire

Family name:

First name:

Title:

Organisation:

Email address:

General questions

Question 1	What do you see as the renewable energy resources (e.g. wind, solar, hydro, biomass etc.) with the maximum potential in your country?
Question 2	What do you see as the most appropriate technology (e.g. wind turbines, solar PV, etc.) to harnessing the renewable resources in your country?
Question 3	Name the most needed energy services (e.g. lighting, cooling, transportation, etc.) you believe renewable energies are best suited to deliver in your country
Question 4	In your opinion, which renewable energy technology is most suitable for expanding access to energy in your country? <i>If you are responding from North America or Europe - please leave blank.</i>
Question 5	Which institution/entity is most critical to driving the transition to renewable energy in your country? Specify more than one institution/entity if necessary.
Question 6	What do you see as the major barrier to the widespread adoption of renewable energy in your country? Specific more than one barrier if necessary.

Question 7	As a stakeholder in renewable energy, do you have easy access to the types of information (e.g. resource info, energy statistics, etc.) you need to carry out your role? (Yes or No?)
Yes	
No	
	If no, what kinds of information resources are needed to effectively carry out your role?
Question 8	Is there sufficient human capacity in your country with the skills needed to support the widespread adoption of renewable energy technologies? (Yes or No?)
Yes	
No	
	If no, what kind of capacity-building is needed?

Policy & Regulation Questions

Question 9	Which government policy has so far been most effective in promoting renewable energy technologies in your country? Specify more than one if necessary.
Question 10	Which regulatory instruments (e.g. feed-in tariffs, net metering, third-party sale, tradable certificates, etc.) have been most effective in promoting renewables in your country so far? Specify more than one if necessary.

Business & Finance Questions

Question 11	In your opinion, which is the key business model (e.g. franchising, ESCOs, build-operate-transfer, public-private partnerships) offering the best potential for creating thriving renewable energy businesses?
Question 12	What do you believe is the main source (e.g. government, local banks/Fis, private sector, development aid, etc.) for the financing of renewable energy technologies in your country?

Appendix B: Respondents by Organisation

INSTITUTION / ORGANISATION	COUNTRY
A&S Bioenergia (www.aesbioenergia.com.br)	Brazil
ABPS Infrastructure Advisory Private Limited	India
AGL Energy	Australia
Alliance to Save Energy, India	India
Alternative Energy Institute	United States of America
Alternative Energy Institute, West Texas A&M University, USA	China
Alternative Technology Association	Australia
American Council On Renewable Energy (ACORE)	United States of America
Asia-Pacific Energy Group & FSM National Government – Dept. of R&D	Federated States of Micronesia
Australian Department of Resources, Energy and Tourism (DRET)	Australia
Baker & McKenzie	Australia
Beijing Jike Energy New Tech. Development	China
Beijing Jikedian Renewable Energy Development Centre	China
Beijing Taitiandi Energy Ltd/ China Rural Energy Industrial Association	China
Biomass Users Network	Costa Rica
British Embassy, Brasilia	Brazil
British High Commission South Africa	South Africa
Carbon Crossing Ecological Services Pvt Ltd	India
Center of Renewable Energy Development, Energy Research Institute, NDRC	China
Centre for Air Power Studies	India
Centre for International Cooperation in Agronomic R&D (CIRAD)	Costa Rica
Centre of Tropical Agricultural Research and Education (CATIE)	Costa Rica
Centro de Informacion en Energias Renovables (CINER)	Bolivia
Cepel - Electric Power Research Centre	Brazil
CES	Gambia
China General Certification Center/Chinese Wind Power Association	China
China Hydropower Engineering Consulting Group Corporation	China
Chinese Renewable Energy Entrepreneur Club	China
Chinese Renewable Energy Industries Association	China
Chinese Renewable Energy Society Photovoltaic Committee	China
City of Cape Town	South Africa
Clean Energy Asia	Vietnam
Clique Developments Limited	India
Colorado Public Utilities Commission	United States of America
Conduit Ventures Limited	China
Council for Scientific Research	South Africa
CSI Engineering	Uruguay
Department of Climate Change, NDRC	China
Department of Energy and Climate Change, UK	United Kingdom
Department of Environment, Energy and Telecommunications	Costa Rica
Deutsche Bank	Europe
Direction Générale de l’Energie	Benin
Direction Générale de l’Energie (Ministère des Mines et de l’Energie)	Cote d’Ivoire

Direction Nationale de l'Énergie	Mali
Division of Energy and Environment, Commission on Science and Technology for Development, Ministry of Agriculture	China
E+Co	Costa Rica
ECN	Gambia
ECO SOL	Bolivia
ECO-Asia Clean Development and Climate Program	China
ECO-Asia Clean Development and Climate Program	Philippines
Ecoficiencia	Honduras
ECREEE (Regional Centre for Renewable Energy and Energy Efficiency)	Cape Verde
Emergent Ventures India private Limited	India
ENERCAL	New Caledonia
Energies Ltd.	United States of America
Energy and Environmental Development Consulting Limited	China
Energy Commission	Ghana
Energy Commission of Nigeria	Nigeria
Energy Division	Cook Islands
Energy Efficiency Project Investment Company, Limited (EEPIC)	China
Energy Research Institute, NDRC	China
Enviro Legal Defence Firm	India
Environmental Monitoring Group	South Africa
Environmental Protection Agency, USA	United States of America
Envision	Malaysia
Ergon Energy	Australia
ESEIM Solar Co.Ltd	Gambia
ESKOM	South Africa
European Photovoltaic Industry Association	Europe
Faculty of Natural Sciences and Surveying (FaCENA) at UNNE	Argentina
Federal Ministry for the Environment, Nature Conservation & Nuclear Safety	Germany
Foundation Tany Meva	Madagascar
Fraunhofer ISE	Germany
French Development Bank (AFD)	South Africa
Fundacion Solar	Guatemala
Gaia Association (Ethiopian NGO)	Ethiopia
GAM-Solar Energy & Engineering Co. Ltd.	Gambia
Gender and Energy Research and Training	South Africa
German Solar Industry Association	Germany
Government of the Netherlands, Ministry of Economic Affairs	Netherlands
Green Power Labs Inc	United States of America
Greenergy Renewables pvt Ltd	India
Group of Studies & Development of Energy Alternatives (GEDAE-UFPA) and the National Institute of Science & Technology of Renewable Energy and Energetic Efficiency of the Amazon (INCT-EREEA).	Brazil
Guangzhou Hongying Energy Technology Co., LTD	China
Himin Group	China
Hi-tech Division, Ministry of Science and Technology	China
Horizon Power	Australia
Human Sciences Research Council	South Africa

Hydro Tasmania	Australia
ICLEI (Local Governments for Sustainability) LA&C Secretariat	Brazil
Independent Consultants	Various
India Trade Promotion Organisation	India
Indian Institute of Social Welfare and Business Management	India
Indian Institute of Technology - Bombay	India
Indian Renewable Energy Development Agency Ltd. (IREDA), India	India
Indira Gandhi Integral Education Centre,	India
Indonesian Clean power Ventures Pty Ltd	Indonesia
Ingendehsa S.A. de C.V.	El Salvador
Inter-American Development Bank	International Organisation
International Institute for water and environmental Engineering (2iE)	Burkina Faso
International Power Control Systems Private Limited	Malawi
IRG China Representative Office	China
KfW Development Bank	Germany
KNUST, Kumasi/Aekosolar Enterprise	Ghana
Latin American Energy Organization (OLADE)	Regional Organization
LGA Consultants (Pvt) Ltd / Sage Training (Pvt) Ltd/ Energy Forum	Sri Lanka
Macquarie Bank Limited	Australia
Madras School of Economics	India
Malawi Energy Regulatory Authority(MERA)	Malawi
Mercados EMI	India
Milestone Capital	China
Ministry for the Environment Land and Sea of Italy	Italy
Ministry of Economy	Spain
Ministry of Energy	Gambia
Ministry of Energy	Ghana
Ministry of Energy	Guinea Bissau
Ministry of Energy and Power development	Zimbabwe
Ministry of Environment, Housing and Territorial Development of Colombia	Colombia
Ministry of Finance	Samoa
Ministry of Mines & Energy	Togo
Ministry of Renewable Energy, Senegal	Senegal
Ministry of Resources and Development	Republic of the Marshall Islands
Moser Baer Solar	India
Moserbaer Photovoltaic Limited	India
Mozambican Department of Energy	Mozambique
National Business Initiative	South Africa
National Centre for Energy Research and Development	Nigeria
National Centre for Hydropower Res. And Development, University of Ilorin	Nigeria
National Electrification Administration	Philippines
National Energy Efficiency Institute	South Africa
National Energy Regulator	South Africa
National Rural Electric Cooperative Association (NRECA) International Ltd	Guatemala
National Society of Coal SNCC-SA	Niger
National Solar Power	United States of America
National Union of Mineworkers	South Africa

Natural Resources Canada	Canada
Nauru Utilities	Nauru
New Energy Department, National Energy Administration	China
New Era Solar Solutions Pvt Ltd.	India
Nollen Group - Prime Energy Investments	Thailand
Norwegian Embassy Mozambique	Mozambique
Norwegian Embassy South Africa	South Africa
Office of the Utilities Regulatory Authority	Vanuatu
Palau Energy Office	Palau
Performance Partners Consulting (Pty) Ltd	South Africa
Petrobras	Brazil
Petroleum Corporation of Jamaica	Jamaica
PFAN-ECO Asia Indonesia	Indonesia
Pitt&Sherry Engineering Consultants	Australia
Planet Finance Southern Africa	Southern Africa
Power Systems Engineering, The Gambia	Gambia
Prakartee	India
Prax Capital	China
Prime Minister's Office	Tonga
Project Gaia, Nigeria	Nigeria
Projectioneering	Australia
Projeto Gaia- Brasil www.projetoGaia.com	Brazil
PV & Wind Power Systems Quality Test Centre, Chinese Academy of Sciences	China
REEEP Southern Africa	Southern Africa
Regulation Authority of the Electricity Sector	Togo
Renewable Energy and Energy Efficiency Institute	Namibia
Renewables South Australia	Australia
RENOVE, Renewable Energy Network	Brazil
RESDEM Consulting Ltd	Ghana
Restio Energy	South Africa
SANERI - South Africa's National Energy Research Institute	South Africa
SBI Capital Markets Ltd	India
Scatec AS	Norway
Seco Controls pvt. Ltd	India
Secretariat for Innovation, Ministry of Development, Industry & Foreign Trade	Brazil
Servicios Ambientales S.A.	Bolivia
Shadong SiFon Environmental Protection & Bio-Energy	China
Shakti Sustainable Energy Foundation	India
Sino-Demark Wind Energy Development Office	China
SINTEF Energy Research	Norway
SNV Netherlands Development Organisation	Nepal
South African National Energy Research Institute	South Africa
Southern African Power Pool	Southern Africa
Spatium environmental planning/design	South Africa
Suministros Electricos y Electronicos SA de CV	El Salvador
SunBorne Energy	India
Suntech Power Holdings Co., Ltd.	China

Sustainable Energy Africa	South Africa
Sustainable Energy Authority of Ireland	Ireland
Swiss Agency for Development and Cooperation	India
Tamilnadu Urban Infrastructure Financial Services Ltd., Chennai	India
Tasmanian Renewable Energy Industry Development Board (TREIDB)	Australia
TERI - The Energy and Resources Institute	India
The Energy and Resources Institute	India
The Energy Foundation	China
The Institute for Sustainable Development and Renewable Energy (IDER)	Brazil
The Power Company	South Africa
Torresolar SRL	Argentina
TRUenergy	Australia
Tsinghua University	China
Unasol	Brazil
Union Fenosa Wind Australia	Australia
University of Itajubá (UNIFEI)	Brazil
USAID	India
USAID ECO-Asia Clean Development and Climate Program	India
USAID/Brazil	Brazil
Vanuatu Renewable Energy and Power Association/Green Power	Vanuatu
VERDUROUS SOLUTIONS PRIVATE LIMITED	India
Vestas	Australia
Vestas	China
Willies Electrical and Solar Power Company	Solomon Islands
World Bank Beijing Office	China
Worldwatch Institute	United States of America
ZRW Mechanika	South Africa

Appendix C: Respondents by Country

INSTITUTION / ORGANISATION	COUNTRY
Faculty of Natural Sciences and Surveying (FaCENA) at UNNE	Argentina
Torresolar SRL	Argentina
AGL Energy	Australia
Alternative Technology Association	Australia
Australian Department of Resources, Energy and Tourism (DRET)	Australia
Baker & McKenzie	Australia
Ergon Energy	Australia
Horizon Power	Australia
Hydro Tasmania	Australia
Macquarie Bank Limited	Australia
Pitt&Sherry Engineering Consultants	Australia
Projectioneering	Australia
Renewables South Australia	Australia
Tasmanian Renewable Energy Industry Development Board (TREIDB)	Australia
TRUenergy	Australia
Union Fenosa Wind Australia	Australia
Vestas	Australia
Direction Générale de l'Énergie	Benin
Centro de Informacion en Energias Renovables (CINER)	Bolivia
ECO SOL	Bolivia
Servicios Ambientales S.A.	Bolivia
A&S Bioenergia (www.aesbioenergia.com.br)	Brazil
British Embassy, Brasilia	Brazil
Cepel - Electric Power Research Centre	Brazil
Group of Studies & Development of Energy Alternatives (GEDAE-UFPA) and the National Institute of Science & Technology of Renewable Energy and Energetic Efficiency of the Amazon (INCT-EREEA).	Brazil
ICLEI (Local Governments for Sustainability) LA&C Secretariat	Brazil
Petrobras	Brazil
Projeto Gaia- Brasil www.projetoGaia.com	Brazil
RENOVE, Renewable Energy Network	Brazil
Secretariat for Innovation, Ministry of Development, Industry & Foreign Trade	Brazil
The Institute for Sustainable Development and Renewable Energy (IDER)	Brazil
Unasol	Brazil
University of Itajubá (UNIFEI)	Brazil
USAID/Brazil	Brazil
International Institute for water and environmental Engineering (2iE)	Burkina Faso
Natural Resources Canada	Canada
ECREEE (Regional Centre for Renewable Energy and Energy Efficiency)	Cape Verde
Alternative Energy Institute, West Texas A&M University, USA	China
Beijing Jike Energy New Tech. Development	China
Beijing Jikedian Renewable Energy Development Centre	China
Beijing Taitiandi Energy Ltd/ China Rural Energy Industrial Association	China
Center of Renewable Energy Development, Energy Research Institute, NDRC	China
China General Certification Center/Chinese Wind Power Association	China
China Hydropower Engineering Consulting Group Corporation	China
Chinese Renewable Energy Entrepreneur Club	China
Chinese Renewable Energy Industries Association	China
Chinese Renewable Energy Society Photovoltaic Committee	China
Conduit Ventures Limited	China
Department of Climate Change, NDRC	China

Division of Energy and Environment, Commission on Science and Technology for Development, Ministry of Agriculture	China
ECO-Asia Clean Development and Climate Program	China
Energy and Environmental Development Consulting Limited	China
Energy Efficiency Project Investment Company, Limited (EEPIC)	China
Energy Research Institute, NDRC	China
Guangzhou Hongying Energy Technology Co., LTD	China
Himin Group	China
Hi-tech Division, Ministry of Science and Technology	China
IRG China Representative Office	China
Milestone Capital	China
New Energy Department, National Energy Administration	China
Prax Capital	China
PV & Wind Power Systems Quality Test Centre, Chinese Academy of Sciences	China
Shadong SiFon Environmental Protection & Bio-Energy	China
Sino-Demark Wind Energy Development Office	China
Suntech Power Holdings Co., Ltd.	China
The Energy Foundation	China
Tsinghua University	China
Vestas	China
World Bank Beijing Office	China
Ministry of Environment, Housing and Territorial Development of Colombia	Colombia
Energy Division	Cook Islands
Biomass Users Network	Costa Rica
Centre of Tropical Agricultural Research and Education (CATIE)	
Centre for International Cooperation in Agronomic R&D (CIRAD)	Costa Rica
Department of Environment, Energy and Telecommunications	Costa Rica
E+Co	Costa Rica
Direction Générale de l'Énergie (Ministère des Mines et de l'Énergie)	Cote d'Ivoire
Ingendehsa S.A. de C.V.	El Salvador
Suministros Electricos y Electronicos SA de CV	El Salvador
Gaia Association (Ethiopian NGO)	Ethiopia
Deutsche Bank	Europe
European Photovoltaic Industry Association	Europe
Asia-Pacific Energy Group & FSM National Government – Dept. of R&D	Federated States of Micronesia
CES	Gambia
ECN	Gambia
ESEIM Solar Co.Ltd	Gambia
GAM-Solar Energy & Engineering Co. Ltd.	Gambia
Ministry of Energy	Gambia
Power Systems Engineering, The Gambia	Gambia
Fraunhofer ISE	Germany
Federal Ministry for the Environment, Nature Conservation & Nuclear Safety	Germany
German Solar Industry Association	Germany
KfW Development Bank	Germany
Energy Commission	Ghana
KNUST, Kumasi/Aekosolar Enterprise	Ghana
Ministry of Energy	Ghana
RESDEM Consulting Ltd	Ghana
Fundacion Solar	Guatemala
National Rural Electric Cooperative Association (NRECA) International Ltd	Guatemala
Ministry of Energy	Guinea Bissau
Ecoficiencia	Honduras
ABPS Infrastructure Advisory Private Limited	India
Alliance to Save Energy, India	India

Carbon Crossing Ecological Services Pvt Ltd	India
Centre for Air Power Studies	India
Clique Developments Limited	India
Emergent Ventures India private Limited	India
Enviro Legal Defence Firm	India
Greenergy Renewables pvt Ltd	India
India Trade Promotion Organisation	India
Indian Institute of Social Welfare and Business Management	India
Indian Institute of Technology - Bombay	India
Indian Renewable Energy Development Agency Ltd. (IREDA), India	India
Indira Gandhi Integral Education Centre,	India
Madras School of Economics	India
Mercados EMI	India
Moser Baer Solar	India
Moserbaer Photovoltaic Limited	India
New Era Solar Solutions Pvt Ltd.	India
Prakartee	India
SBI Capital Markets Ltd	India
Seco Controls pvt. Ltd	India
Shakti Sustainable Energy Foundation	India
SunBorne Energy	India
Swiss Agency for Development and Cooperation	India
Tamilnadu Urban Infrastructure Financial Services Ltd., Chennai	India
TERI - The Energy and Resources Institute	India
The Energy and Resources Institute	India
USAID	India
USAID ECO-Asia Clean Development and Climate Program	India
VERDUROUS SOLUTIONS PRIVATE LIMITED	India
Indonesian Clean power Ventures Pty Ltd	Indonesia
PFAN-ECO Asia Indonesia	Indonesia
Inter-American Development Bank	International Organisation
Sustainable Energy Authority of Ireland	Ireland
Ministry for the Environment Land and Sea of Italy	Italy
Petroleum Corporation of Jamaica	Jamaica
Foundation Tany Meva	Madagascar
International Power Control Systems Private Limited	Malawi
Malawi Energy Regulatory Authority(MERA)	Malawi
Envision	Malaysia
Direction Nationale de l'Energie	Mali
Mozambican Department of Energy	Mozambique
Norwegian Embassy Mozambique	Mozambique
Renewable Energy and Energy Efficiency Institute	Namibia
Nauru Utilities	Nauru
SNV Netherlands Development Organisation	Nepal
Government of the Netherlands, Ministry of Economic Affairs	Netherlands
ENERCAL	New Caledonia
National Society of Coal SNCC-SA	Niger
Energy Commission of Nigeria	Nigeria
National Centre for Energy Research and Development	Nigeria
National Centre for Hydropower Res. And Development, University of Ilorin	Nigeria
Project Gaia, Nigeria	Nigeria
Scatec AS	Norway
SINTEF Energy Research	Norway
Palau Energy Office	Palau

ECO-Asia Clean Development and Climate Program	Philippines
National Electrification Administration	Philippines
Latin American Energy Organization (OLADE)	Regional Organization
Ministry of Resources and Development	Republic of the Marshall Islands
Ministry of Finance	Samoa
Ministry of Renewable Energy, Senegal	Senegal
Willies Electrical and Solar Power Company	Solomon Islands
British High Commission South Africa	South Africa
City of Cape Town	South Africa
Council for Scientific Research	South Africa
Environmental Monitoring Group	South Africa
ESKOM	South Africa
French Development Bank (AFD)	South Africa
Gender and Energy Research and Training	South Africa
Human Sciences Research Council	South Africa
National Business Initiative	South Africa
National Energy Efficiency Institute	South Africa
National Energy Regulator	South Africa
National Union of Mineworkers	South Africa
Norwegian Embassy South Africa	South Africa
Performance Partners Consulting (Pty) Ltd	South Africa
Restio Energy	South Africa
SANERI - South Africa's National Energy Research Institute	South Africa
South African National Energy Research Institute	South Africa
Spatium environmental planning/design	South Africa
Sustainable Energy Africa	South Africa
The Power Company	South Africa
ZRW Mechanika	South Africa
Planet Finance Southern Africa	Southern Africa
REEEP Southern Africa	Southern Africa
Southern African Power Pool	Southern Africa
Ministry of Economy	Spain
LGA Consultants (Pvt) Ltd / Sage Training (Pvt) Ltd/ Energy Forum	Sri Lanka
Nollen Group - Prime Energy Investments	Thailand
Ministry of Mines & Energy	Togo
Regulation Authority of the Electricity Sector	Togo
Prime Minister's Office	Tonga
Department of Energy and Climate Change, UK	United Kingdom
Alternative Energy Institute	United States of America
American Council On Renewable Energy (ACORE)	United States of America
Colorado Public Utilities Commission	United States of America
Energies Ltd.	United States of America
Environmental Protection Agency, USA	United States of America
Green Power Labs Inc	United States of America
National Solar Power	United States of America
Worldwatch Institute	United States of America
CSI Engineering	Uruguay
Office of the Utilities Regulatory Authority	Vanuatu
Vanuatu Renewable Energy and Power Association/Green Power	Vanuatu
Independent Consultants	Various
Clean Energy Asia	Vietnam
Ministry of Energy and Power development	Zimbabwe

Acknowledgements

REEEP would like to acknowledge the work of:

Ms. Claire Swadkin who compiled this report on behalf of the International Secretariat, and who also conducted stakeholder interviews for Europe and North America, and Mr. Vince Reardon who supervised the editing.

The REEEP Regional Secretariats who each conducted 30 or more stakeholder consultations with key persons in their respective regions, and Ms. Salome Okaibea Sarfo who surveyed respondents in West Africa.

All 232 international renewable energy stakeholders, who offered their time for consultation and provided their valuable input to enable this report.

Disclaimer

This printed publication is provided as service by the Renewable Energy and Energy Efficiency Partnership (REEEP). Although we strive to provide carefully researched and diligently compiled information, the information materials included in this printed publication are provided "as is", without warranty of any kind, either express or implied, including, without limitation, warranties of completeness, accuracy, suitability for a particular purpose and non-infringement. REEEP specifically does not make any warranties or representations as to the accuracy or completeness of any such printed publications. Neither does it warrant that use of the information is free of any claims of copyright infringement. If an attribution indicates that the information is from a source external to REEEP, permission for reuse must be sought from the originating source.

Under no circumstances shall the REEEP be liable for any loss, damage, liability or expense incurred or suffered that is claimed to have resulted from the use of its printed publications, including, without limitation, any fault, error, omission, interruption or delay with respect thereto. The use of REEEP's printed publications is at the user's sole risk. Under no circumstances, including but not limited to negligence, shall REEEP be liable for any direct, indirect, incidental, special or consequential expenses or damages incurred by reason of its use.

This printed publication may contain references to various information sources not under the control of REEEP. Such references do not imply any official endorsement of or responsibility for the opinions, ideas, data, or products presented by these sources, or guarantee the validity of the information provided. References to such external sources are provided solely as a pointer to information on topics that may be useful to REEEP staff and the public. Furthermore, the mention of names of specific companies or products (whether or not indicated as registered) does not imply any intention to infringe proprietary rights, nor should it be construed as an endorsement or recommendation on the part of the REEEP.

REEEP International Secretariat

Vienna International Centre, D-1738
Wagramer Strasse 5
A – 1400, Vienna , Austria

Phone: + 43 1 26026 3425

Fax: + 43 1 21346 3425

Email: info@reeep.org

Website: www.reeep.org

