



SUSTAINABLE  
ENERGY FOR ALL

# SUSTAINABLE ENERGY FOR ALL

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## A Global Action Agenda

*Pathways for Concerted Action  
toward Sustainable Energy for All*

The Secretary-General's High-Level Group  
on Sustainable Energy for All

APRIL 2012

# THE SECRETARY-GENERAL'S HIGH-LEVEL GROUP ON SUSTAINABLE ENERGY FOR ALL

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# PREFACE

*In launching the Sustainable Energy for All initiative at the opening of the UN General Assembly in September 2011, my aim was to catalyse action around three clear objectives to be achieved by 2030:*

- **Ensuring universal access to modern energy services.**
- **Doubling the global rate of improvement in energy efficiency.**
- **Doubling the share of renewable energy in the global energy mix.**

I asked Charles Holliday and Kandeh Yumkella to lead a High-level Group on Sustainable Energy for All and deliver a Global Action Agenda prior to the UN Conference on Sustainable Development (Rio+20). This document reflects their work.

In January, I presented to the General Assembly my five-year action agenda, “*The Future We Want*”—a plan to help create a safer, more secure, more sustainable, more equitable future. I made Sustainable Energy for All a top priority because it is central to all aspects of sustainable development. That same month, the report of the High-level Panel on Global Sustainability, “*Resilient People, Resilient Planet: A Future Worth Choosing*,” endorsed the Sustainable Energy for All initiative and said it “should be implemented without delay.”

That is why I am pleased to receive this Global Action Agenda. We know enough about the need for sustainable energy. Now it is time to act.

By bringing together leaders from government, finance, business and civil society, we can establish partnerships that will make sustainable energy for all a reality. The scale of the global energy transition is too large for governments to lead alone. Private investment and business engagement will be essential to success. Civil society organizations must help effect and sustain change.

Increasingly, such partnerships will be central to the UN’s work across the breadth of the organisation. That is why I plan to create a UN partnership facility to support multi-stakeholder engagement as a matter of priority during my second term.

The upcoming UN Conference on Sustainable Development is an opportunity to mobilise support for sustainable energy investments. It is an opportunity to put the world on a truly sustainable path: economically, socially, and environmentally. It is our chance to connect the dots among the issues of climate change, energy, water, and food, healthy oceans, gender empowerment, poverty reduction and global health, and addressing inequality. It is our chance to make growth inclusive while respecting planetary boundaries.

Rio is not the end, but the beginning of a multi-year mission on these issues and, especially, on Sustainable Energy for All. With this Global Action Agenda, let us take action to make it reality.

*Ban Ki-moon, Secretary-General of the United Nations*

*April 2012*

# FOREWORD

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This is the third of the principal documents prepared for the Secretary-General's Sustainable Energy for All initiative: the Secretary-General's own vision statement in November charting our course, the Framework for Action we endorsed in January this year, and now this Global Action Agenda. For most advisory groups, that would mean an end. We see it as a beginning.

We agreed to take on the leadership of the Secretary-General's High-level Group on Sustainable Energy for All for one simple reason: to spark concrete international action to address the initiative's three objectives—energy access, energy efficiency, and renewable energy—in an integrated way. We have reached out to governments, businesses, and civil society in designing this agenda, and we have encouraging results to report.

This Global Action Agenda recommends eleven Action Areas to help focus our efforts and mobilize commitments toward the three objectives. Each of the Action Areas includes a number of high-impact opportunities that government, business, and civil society can rally around.

Many developing countries have expressed interest in participating. Ghana, one of the first countries to partner with the initiative, is already developing national energy plans and programmes of action that include policy changes to help unlock private investment flow. This begins a new type of partnership between developing countries, which will support reforms to catalyse investment, and development partners, which will provide support through capacity building, policy advice, and innovative financing mechanisms.

In Brussels on April 16, José Manuel Barroso, President of the European Commission, announced a new initiative called “Energising Development.” It sets an ambitious goal—to help provide access to sustainable energy services to 500 million people by 2030. In addition, a Technical Assistance Facility will be supported with 50 million euros over the next two years, drawing on EU experts to develop technical expertise in developing countries.

Many are already leading the way. In Brazil, the Light for All initiative has brought about 15 million Brazilians out of darkness. China has become a world leader in renewable energy. India has set an ambitious target of more than doubling their renewable energy capacity in 10 years. And, the Energy+ international partnership demonstrates Norway's strong commitment to universal clean energy access.

We have also heard from other stakeholders about their plans to announce commitments to action that will move the world more rapidly toward Sustainable Energy for All. For example, the Clean Energy Ministerial is promoting game-changing initiatives such as the Global Lighting and Energy Access Partnership. And we have heard from civil society and individuals all around the world—from the Institute of Electrical and Electronics Engineers to the rock band LinkinPark—about their desire to engage and support the vision of Sustainable Energy for All.

This is a hopeful start. But the challenge of transforming the world's energy systems will require the engagement over the next two decades. The purpose of this Global Action Agenda is to provide a context and guidance for that evolving work, to suggest high-impact opportunities, and to attract commitments to action in Rio and beyond—for the next 5, 10, and 20 years. The Action Agenda will continue to be refined as we move forward, through consultations facilitated by the initiative.

These actions will do much to eradicate energy poverty. They will also lead to sustainable growth, the development of new markets, the creation of new businesses and jobs, and increased global prosperity. The opportunities amount to trillion-dollar markets. We urge you to join us on this adventure.

*Chad Holliday and Kandeh Yumkella, Co-Chairs of the High-level Group on Sustainable Energy for All  
April 2012*



# EXECUTIVE SUMMARY

**Energy is the golden thread** that connects economic growth, increased social equity, and an environment that allows the world to thrive. Development is not possible without energy, and sustainable development is not possible without sustainable energy.

**The Sustainable Energy for All initiative will catalyse major new investments to speed the transformation of the world's energy systems, pursue the elimination of energy poverty, and enhance prosperity.** UN Secretary-General Ban Ki-moon has launched this global initiative to mobilise all stakeholders to take concrete action toward three critical objectives to be achieved by 2030: (1) ensuring universal access to modern energy services; (2) doubling the global rate of improvement in energy efficiency; and (3) doubling the share of renewable energy in the global energy mix.

**The initiative will “change the game” by introducing new public-private partnerships built from constructive dialogue on policy, investment, and market development by governments, businesses, and civil society.** It brings together the global convening power of the United Nations, the ability to mobilise bold commitments and leverage large-scale investment, and a rapidly expanding knowledge network.

**This Global Action Agenda charts a path forward** for the initiative and its stakeholders. It also aims to help countries and stakeholders create their own pathways toward Sustainable Energy for All, based on technology choices that are appropriate to their unique national and local circumstances. It serves as the starting point of a longer journey and is a living and evolving document that will be periodically refined.

**The Global Action Agenda identifies 11 Action Areas to achieve the three objectives.** These provide a framework for identifying high-impact opportunities; a way to organise multi-stakeholder actions across all relevant sectors of the economy; and tangible entry points for stakeholders interested in taking action in specific areas of interest.

**The Action Areas include seven “sectoral” areas:** (1) modern cooking appliances and fuels; (2) distributed electricity solutions; (3) grid infrastructure and supply efficiency; (4) large-scale renewable power; (5) industrial and agricultural processes; (6) transportation; and (7) buildings and appliances. There are also four “enabling” Action Areas: (1) energy planning and policies; (2) business model and technology innovation; (3) finance and risk management; and (4) capacity building and knowledge sharing.

**We invite all stakeholders to take action across all relevant sectors.** Each Action Area contains a set of high-impact opportunities that will drive transformational change. These high-impact opportunities will be addressed by actions already under way that align with the objectives of Sustainable Energy for All, as well as actions that arise from new initiatives and partnerships. We seek not just participation, but strong collaboration of multiple stakeholders across all relevant sectors of the economy.

**This Action Agenda will accelerate global momentum toward Sustainable Energy for All** by linking the results of individual actions with its ambitious global objectives. Regular progress assessments will renew a dialogue about the pace and scale of change. The initiative will facilitate a continued multi-stakeholder dialogue involving all relevant sectors to ensure that sustainable energy stays at the forefront of political attention.

**The initiative will track progress toward the three objectives over time.** To instigate and sustain change in the world's energy systems over the next two decades, the initiative will identify metrics to measure the progress of actions in both the short and long term. It will also develop regular assessments of progress toward the three objectives themselves, so that it is clear how much remains to be accomplished, how individual actions are contributing, and where more action is needed.

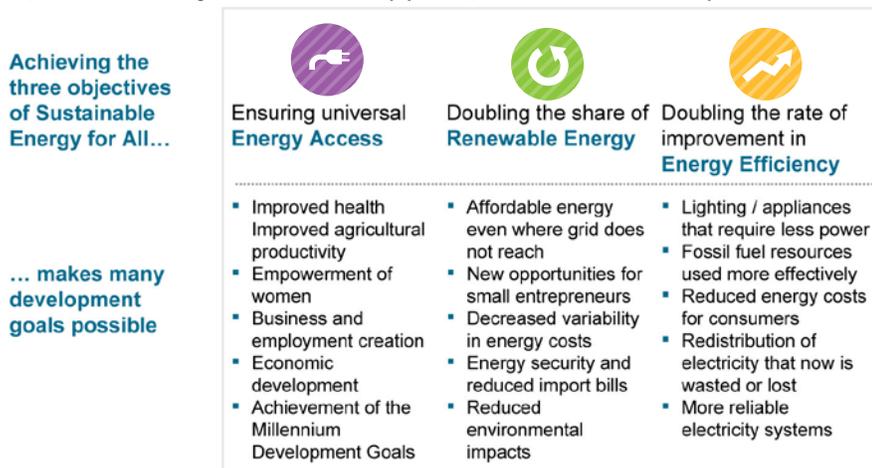
**Sustainable Energy for All is a call to action for our collective future.** Working together, we can achieve a broad-based transformation of the world's energy systems over the next 20 years, harnessing the power of technology and innovation in the service of the planet—for us, for our children, and for generations yet to come.

# 1

## TRANSFORMING THE WORLD THROUGH SUSTAINABLE ENERGY FOR ALL

- 1.1 **Energy is the golden thread that connects economic growth, increased social equity, and an environment that allows the world to thrive.** Access to energy is a necessary precondition to achieving many development goals that extend far beyond the energy sector—eradicating poverty, increasing food production, providing clean water, improving public health, enhancing education, creating economic opportunity, and empowering women. The transition to sustainable energy systems also presents one of the greatest investment opportunities of the 21st century. In short, development is not possible without energy, and sustainable development is not possible without sustainable energy.
- 1.2 **UN Secretary-General Ban Ki-moon has launched a global initiative to achieve Sustainable Energy for All by 2030.** All stakeholders are urged to take concrete action toward three critical objectives: (1) ensuring universal access to modern energy services; (2) doubling the share of renewable energy in the global energy mix; and (3) doubling the global rate of improvement in energy efficiency.

Figure 1: All three objectives are necessary for long-term sustainable development.



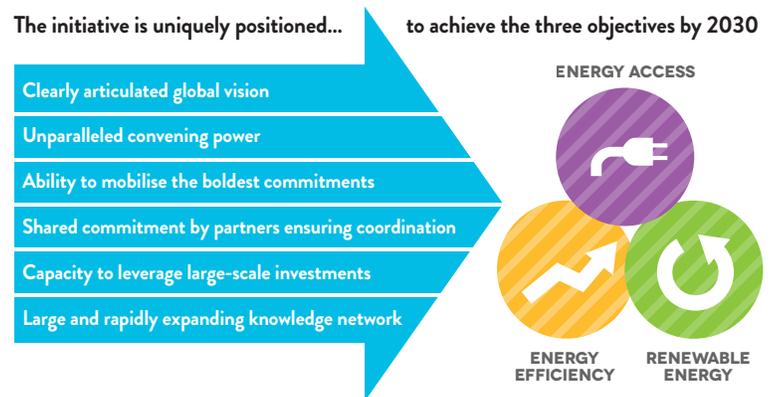
- 1.3 **Realising these objectives will require a decisive shift away from “business as usual.”** There is already growing momentum for cleaner and more efficient energy solutions that can leapfrog existing systems, such as mobile technology revolutionised telecommunications. Many governments and businesses are acting to speed this transition. However, much more action is needed to address regulatory and infrastructure challenges within and beyond the energy sector. Establishing enabling conditions for private investment is critical, because the market will not deliver such a shift without policies that encourage sustainable energy technologies, including, where appropriate, special assistance for low-income individuals and communities. Significant human and financial capital must be mobilised, and the private

sector must be rigorously engaged. This action must be taken urgently to counter the expected headwinds of population growth, climate change, and increasing resource scarcity. No less than a worldwide effort is required to accelerate the transition, given the scale of both the challenges and the opportunities.

- 1.4 **The pursuit of Sustainable Energy for All will catalyse a transformation in the world’s energy systems toward an equitable and sustainable future.** It must proceed from a new spirit of dialogue and collaboration, so that energy in 2030 is much more widely shared, cleanly produced, and efficiently used. Transforming the world’s energy systems will lead to new multi-trillion-dollar investment opportunities to eliminate energy poverty, integrate and balance conventional and renewable energy sources, and enhance prosperity in developed and developing countries alike.
- 1.5 **The Sustainable Energy for All initiative will “change the game” and add value by presenting a new pattern of partnership,** built from constructive dialogue on policy, investment, capacity building, and market development by governments, businesses, and civil society. The initiative provides an unrivalled platform to accelerate the transformation of the world’s energy systems, because it brings together:

- **A clearly articulated global vision and objectives** that can orient actions and be flexibly adapted to unique local circumstances.
- **An unparalleled convening power** power that will help build a common agenda, spur concerted action toward shared goals, and bring about greater coordination of development assistance at the global and national levels (e.g., through the UN Resident Coordinators and the UN Global Compact Local Networks).

Figure 2: Value proposition of Sustainable Energy for All initiative



- **The ability to mobilise bold commitments** engaging the broadest range of possible stakeholders to work toward a defined global vision and nationally tailored objectives.
- **A shared commitment by all partners that ensures the highest degree of coordination** to effectively identify synergies and foster multi-stakeholder partnerships to address collective action problems across all relevant sectors of the economy.
- **A capacity to leverage large-scale investment** by fostering the enabling conditions for success, including innovative approaches to mitigate risk, and tapping into a broad array of businesses and financiers.
- **A large and rapidly expanding knowledge network** to identify and disseminate successful ideas and establish multiple communities of practice.

- 1.6 **The initiative embraces a set of guiding principles that steer its operation.** These include: full inclusion of all parties, collaboration to catalyse action at all levels, transparency by all stakeholders on commitments made, dissemination of lessons and best practices, and acceptance of a diversity of approaches, including technology choices based on unique national and local circumstances.
- 1.7 **This document charts a path forward for the initiative and its stakeholders** by identifying critical Action Areas and providing a roadmap for next steps.<sup>1</sup> It also aims to help countries and stakeholders create their own pathways toward Sustainable Energy for All. It is the starting point of a longer journey—a living and evolving document that will be periodically refined. As the initiative proceeds, actions are implemented, and lessons are learned, the high-impact opportunities identified here will be modified, strategies updated, and new milestones pursued.

1 The Global Action Agenda builds on the foundation of previous documents prepared by the Secretary-General’s High-level Group on Sustainable Energy for All: *The Secretary-General’s vision statement* presents the case for change and defines the initiative’s three objectives. *The Framework for Action* identifies the value of participation for each major stakeholder group, the benefits of stakeholder collaboration, the structure of the commitment process, and the guiding principles of the initiative. The Action Agenda also is informed by the work of its task forces, including their technical reports, which detail the rationale for action on each objective and reflect the best practices of businesses engaged in the UN Global Compact.

# 2

## ACTION AREAS

- 2.1 **To realise a future with Sustainable Energy for All, leadership is needed from all stakeholder groups across many relevant sectors of the economy.** Progress depends on recognizing the interconnectedness of these stakeholders:
- **National governments must design and implement a set of integrated country actions to drive transformative change of the world's energy systems.** To spur investment, action is needed to create national policy and financial environments that enable change which the market alone will not deliver. This applies to both developing and developed countries, although the challenges to be overcome in each case may be substantially different. Business and civil society should be engaged in the preparation of these plans and programmes.
  - **Private sector leadership is also fundamental to the initiative,** given the role of businesses as solution providers and primary drivers of investment. Most Action Areas involve technology providers, project developers, energy utilities and service providers, providers of finance, and users of energy resources and services. As energy is crucial to business activity, the business opportunities in leading the transformation are clear.
  - **Civil society organizations are needed to effect and sustain change.** Their role is fundamental in identifying, advocating, and monitoring public policy and business action; mobilising social innovation and grassroots action; leading behavioural change; and helping to spread best practices and building capacity at all levels in partnership with governments and businesses.
- 2.2 **To make the vision of Sustainable Energy for All actionable, the three core objectives have been disaggregated into 11 Action Areas.** These are intended to provide:
- **A framework for identifying high-impact opportunities** and cataloguing existing and potential initiatives that can further the three objectives.
  - **A way to organise multi-stakeholder actions** across all relevant sectors of the economy toward the objectives.
  - **A tangible entry point for stakeholders** interested in taking action in specific areas of interest.
- 2.3 **The 11 Action Areas are synthesised from the work of the initiative's task forces.**<sup>2</sup> Together they address almost 95% of global energy consumption, key components of productive energy use, and the supporting mechanisms needed to overcome the most common impediments to action. They also aggregate in coherent groups the high-impact opportunities the task forces identified.<sup>3</sup>



Figure 3: From vision to initiatives

2 The Task Forces, comprised of members of the High-level Group and technical advisors, were asked to elaborate on the rationale for action on each objective. For a detailed discussion of each Action Area, refer to the illustrations at the end of this document.

3 Task Force 1 focused on steps to achieve the energy access objective. Task Force 2 assessed opportunities for advancing the energy efficiency and renewables objectives. Task Force 3 engaged the business network of the High-level Group and the UN Global Compact to compile best practices. Task Force 4 identified opportunities and strategies for public engagement and communications.

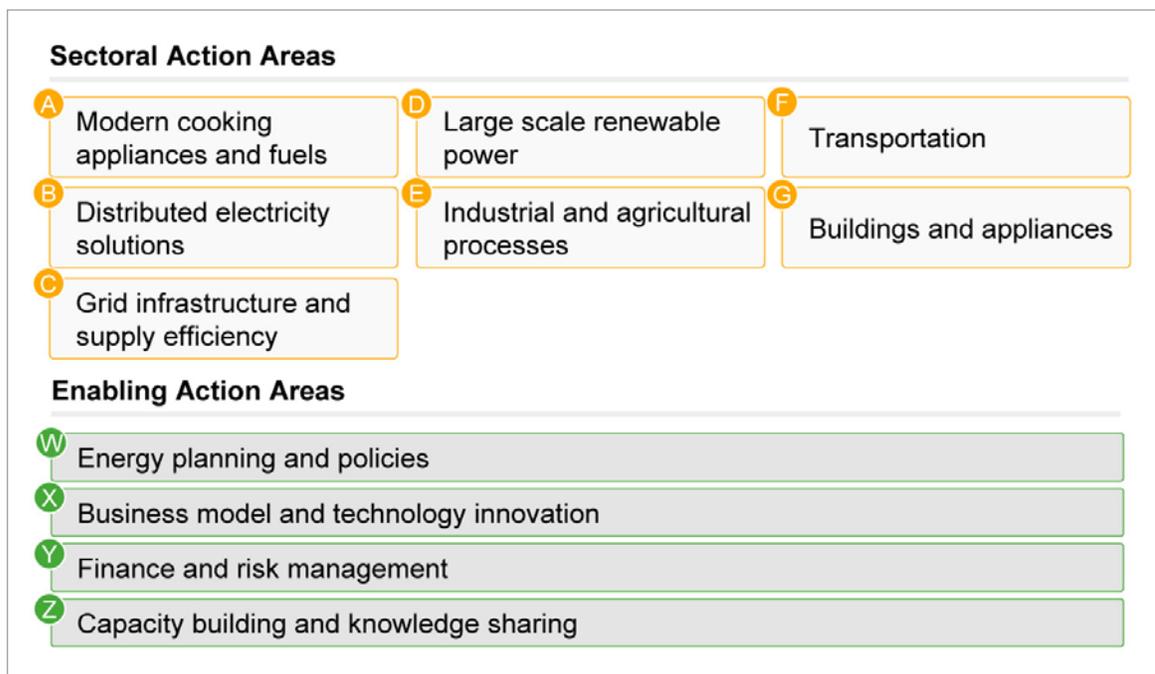


The Action Areas are grouped into two categories—sectoral and enabling:

- The seven **sectoral Action Areas** address both power generation (40% of total primary energy demand in 2009), and the three principal sectors of energy consumption—industry and agriculture, transport and buildings, each of which accounts for roughly a third of total energy consumption. The International Energy Agency projects that each of these sectors will account for a similar share of total primary energy demand in 2030.
- The **four enabling Action Areas** include cross-cutting mechanisms designed to support effective sectoral action, address existing obstacles, and catalyse rapid scaling.

Together the 11 Action Areas form a platform from which progress can be made across all linkages to achieve the three objectives of Sustainable Energy for All.

Figure 4: : Action Areas support economic sectors and foster an enabling environment for progress



#### 2.4 Each Action Area includes many high-impact opportunities for change.

- The Action Agenda encompasses existing initiatives that align with the objectives of Sustainable Energy for All, as well as initiatives that arise from new commitments to action.<sup>4</sup>
- Members of the High-level Group and new partners are expected to lead by example—e.g., by developing initiatives to address high-impact opportunities and mobilising other stakeholders to join their efforts.

<sup>4</sup> Commitments to action, in the context of this initiative, broadly refer to steps that will advance the Action Agenda of Sustainable Energy for All. Commitments to action can take many forms, including policies, projects, programs, products, services, knowledge sharing, and direct financing, as well as partnerships to drive investment. These commitments should be well specified and should accord with the initiative’s guiding principles, including transparency and accountability

## 2.5 Each of the seven sectoral Action Areas supports one or more of the three main objectives.

- (A) **Modern cooking appliances and fuels:** Providing access to modern energy services for those who lack clean and efficient equipment such as stoves and fuels.

*High-impact opportunities:* Building sustainable local value chains for clean and efficient cooking solutions; building market demand by raising awareness of their health, economic, environmental, and gender benefits; investing in the infrastructure and local distribution supply chains required for cleaner fuels (e.g., ethanol and LPG); developing tiered standards for efficiency, emissions and safety; and designing cooking appliances that meet consumer needs and price points.

- (B) **Distributed electricity solutions:** Providing access to electricity through off-grid, micro- and mini-grid solutions, including targeted applications for productive uses.

*High-impact opportunities:* Clean energy mini/micro-grid solutions for rural and targeted industrial applications, using both renewables and conventional sources; locally appropriate regulatory frameworks to incentivise and support commercially viable investments in decentralised electricity solutions; deployment of off-grid renewables and lighting and charging systems, including solar lighting; and self-contained systems that provide uninterrupted power when the grid fails.

**EXAMPLE:** *The Lighting a Billion Lives initiative aims to bring light into the lives of people in rural areas, in India and across the world, by replacing kerosene lamps and candles with solar lighting devices, and by providing livelihood opportunities at the individual and village levels.*

- (C) **Grid infrastructure and supply efficiency:** Extending the electricity grid and increasing the efficiency of energy generation, transmission, and distribution.

*High-impact opportunities:* Traditional grid expansion to unconnected areas; strengthening transmission and distribution networks to reduce losses and improve reliability; regional interconnections to improve performance; improving the efficiency of existing conventional energy generation and interaction between fossil and non-fossil fuels; smart grid technology solutions and grid-scale storage; and redesign of existing plants and networks to facilitate long-distance transmission in a more volatile supply-and-demand environment.

- (D) **Large-scale renewable power:** Accelerating the build-out of grid-connected renewable energy solutions and the associated transmission and distribution infrastructure.

*High-impact opportunities:* Onshore and off-shore wind, solar photovoltaics (PV), solar thermal, concentrating solar power, geothermal, hydropower, and bioenergy, along with specific policies and business models to support them (e.g., grid access, feed-in tariffs, portfolio standards, and public auctions).

**EXAMPLE:** *The Sustainable Development of Hydropower initiative engages governments and private sector participants to promote the sharing of expertise, best practices, and methodologies related to the sustainability and financing of hydropower as well as to motivate multilateral developing and financing agencies to consider sustainable hydropower in their portfolios of possible energy solutions for developing countries.*

- (E) **Industrial and agricultural processes:** Improving production efficiency, both directly and in the supply chain, and converting from chemical to biological feedstocks.

*High-impact opportunities:* Elimination of gas flaring and development of local gas markets; variable-speed motors; energy management practices and systems (e.g., in cement and steel industries); conversion of waste to energy; improved process and system design; cogeneration systems (Combined heat and power); renewable desalination; energy-efficient irrigation pumps; and energy-smart agriculture.

**EXAMPLE:** *The Global Gas Flaring Reduction Partnership brings oil-producing countries, state-owned companies and international oil companies together to discourage the practice of flaring natural gas. The partnership works to overcome barriers to change by sharing best practices and implementing country-specific programs, promoting effective regulatory frameworks, and tackling constraints on gas utilisation.*



- (F) **Transportation:** Increasing fuel efficiency for all classes of vehicles, increasing the share of renewables in the fuel supply, alternatives to personal vehicles and freight transport, and public transit-oriented urban development.

*High-impact opportunities:* Efficiency programmes for internal combustion engines and vehicle design; alternative fuel vehicles, including flex-fuel, hybrid, and electric vehicles (EVs); new power trains for alternative fuels; use of renewable fuels; fuel efficiency and fuel quality standards; overall transportation demand reduction; eco-driving programmes, expanded and more efficient public transport; electrification of rail systems; and freight mode shifting (e.g., from trucks to trains).

- (G) **Buildings and appliances:** Improving efficiency through the proper design, insulation, and retrofit of buildings and incorporating renewable self-generation options where feasible, together with more efficient consumer appliances and equipment.

*High-impact opportunities:* Public / residential / commercial buildings, cool roofs, building integrated solar PV, and small-scale renewables such as rooftop solar and solar hot water; sectoral efficiency labels and performance standards; well enforced building codes; demand-side management programmes and advanced technologies to enable energy-saving behaviour and shift demand across time; advanced lighting, space cooling and heating, and refrigerators; and wider adoption and enforcement of regional minimum efficiency standards and comparable test procedures by industry and local governments.

## 2.6 The four enabling Action Areas include cross-cutting mechanisms that support the sectoral Action Areas at the country, regional, and local levels.

- (W) **Energy planning and policies at all levels:** Promoting direct public action and improving the legal and administrative context for successfully engaging the private sector and civil society.

*High-impact opportunities:* Reviewing and updating national energy targets and plans, including those for energy access, renewables, and efficiency; and creating stable policy environments, institutional frameworks and governance, and policies that support private investment in sustainable energy technologies.

- (X) **Business model and technology innovation:** Developing new approaches to overcome barriers that have impeded the deployment of sustainable energy services and technologies in the past, deliver affordability and reliability, and develop incentives for innovation.

*High-impact opportunities:* Models for delivering modern energy services that do not involve the national electricity network; public-private partnerships with local utilities; match-making between small enterprises and international companies in niche markets; support for start ups and small-to-medium enterprises to achieve scale; consumer credit for energy and appliances; technology innovation policies, including funding for research and development, demonstration projects, knowledge and technology transfer; technology adaptation; and payment plans that overcome consumer resistance to high up-front costs of energy-efficient products through energy savings.

**EXAMPLE: The Global Bioenergy Partnership—GBEP brings together public, private and civil society stakeholders in a joint commitment to promote bioenergy for sustainable development. The Partnership focuses its activities in three strategic areas: sustainable development, climate change and food and energy security.**

**EXAMPLE: The Super-efficient Equipment and Appliance Deployment initiative under the Clean Energy Ministerial engages governments and private sector participants to promote more efficient products through incentives, procurement, and awards; bolster regional efficiency standards and labels; and strengthen coordinated technical analysis to identify cost-effective efficiency opportunities.**

**EXAMPLE: Renewable Readiness Assessments by the International Renewable Energy Agency allow national governments to assess and create clear and transparent policy frameworks, and to develop the institutional capacity and strategies required to support the deployment of renewable energy technologies. The methodology was applied to two countries in 2011 and will be further rolled out in 2012.**

**EXAMPLE: The Energy+ international partnership, started by Norway in 2011, aims to increase energy access at scale and reduce greenhouse gas emissions in developing countries by applying a sector-level approach that leverages private capital and carbon market financing. It is creating technical, policy and institutional frameworks that a country needs to access private financing for low carbon development.**

- (Y) **Finance and risk management:** Promoting instruments to reduce risk and increase private investment in sustainable energy through the targeted use of public and philanthropic capital.

*High-impact opportunities:* Political and regulatory risk insurance, loan guarantees, first-loss coverage, subsidies and tariffs; advance commitments for technology innovation; linkage of small and medium enterprises (SMEs) with local financial institutions; energy savings performance contracting; government procurement of new and existing technologies; climate finance and consumer credit; and mechanisms to mitigate energy price volatility.

- (Z) **Capacity building and knowledge sharing:** Developing human and institutional capacity and adopting successful strategies proven elsewhere for faster replication across the world.

*High-impact opportunities:* Global and regional energy resource mapping; a best practices database; institutional support for local governments; training of policy makers and maintenance and instalment engineers; policy and operational toolkits; and a technical assistance facility for developing energy access plans and projects.

*The European Commission’s “Energising Development” initiative aims to provide access to sustainable energy services for an additional 500 million people in developing countries by 2030.*

**EXAMPLE:** *The Clean Energy Solutions Center shares policy best practices, data, and analytical tools across countries, and serves as a first-stop clearinghouse for clean energy resources. It offers customized policy assistance through direct, no-cost access to experts and online training—to help countries tailor solutions to their needs and foster international collaboration on policy innovations.*

2.7 **Success in each Action Area will require not just the participation but the collaboration of multiple stakeholders across all relevant sectors of the economy.** Governments, businesses, and civil society organisations all have important and complementary roles to play; specifically how they participate will vary by Action Area. Below are representative examples of the types of engagement expected from each stakeholder group:

- **Developing country governments** must create conditions that enable growth by establishing a clear vision, national targets, policies, regulations, and incentives that link energy to overall development, while strengthening national utilities. Institutional frameworks have to be put in place to ensure transparency and a high degree of predictability as a precondition for attracting private investment. They should also build on existing national plans to advance energy access and promote efficiency and renewables in ways that respond to national circumstances and priorities. For example, one country might commit to improving the efficiency of cookstoves and supporting the safe and sustainable sourcing of modern fuels for domestic use, while another might commit to facilitating the development of grid-scale geothermal power.
- **Developed country governments** must focus internally on efficiency and renewables while externally supporting all three objectives through international action. They can elaborate on current plans to increase the deployment of domestic renewable energy and improve energy efficiency through the entire value chain, from production of primary energy through the use of energy services. They can also provide public capital for technical assistance, to support pilot projects or demonstrations, or to fund instruments that reduce private-sector risk. All of these strategies can be used both to drive domestic action and to support developing countries.
- **Regional and local governments** are very important players: Cities already account for three quarters of total final energy consumption and half of the world’s economic output; if current trends continue, 65% of the world’s population will be living in urban areas by 2030. In this context, regional and local governments, urban planners, and transportation authorities can have a great impact on the future of sustainable energy. They can design policies and investments to encourage greater use of public transit, promote bicycling and walking, or speed the adoption of alternative-fuel vehicles by investing in refuelling infrastructure. Governments can also invest in retrofitting public buildings, which represent more than half of the total building stock that is projected to consume 40% of global energy by 2030.



- **Donors and multilateral institutions** are critical to mobilising large resources for country action. They can provide technical assistance and policy guidance, support knowledge and capacity building, and share best implementation practices, as well as make direct financial investments. For example, a multilateral bank could work to strengthen local financial institutions to stimulate investment in energy access and clean energy projects.
  - **Businesses** will have different roles to play, depending not only on the Action Area being addressed but also on their size, the type of product or service they provide, and the value proposition that presents itself. Large international corporations can take the lead in their own sectors—e.g., by mobilising their industries to common action. For example, an automaker could lead an initiative to accelerate the adoption of electric vehicles, while a leading LED manufacturing company and a solar panel manufacturer could jointly undertake a solar lantern initiative with a smaller local business that has experience delivering products and services to rural communities. Financial services companies can offer guidance to governments on policies to increase private-sector investment, and then raise or provide targeted financing for initiatives that will generate returns or could partner with energy service companies that share the performance and/or the credit risk. Technology companies can undertake research and development to bring forward new technologies or adapt existing technologies to new circumstances. All companies, large and small, can make commitments to increase their energy efficiency and use of renewables in their own operations and supply chains.
  - **Civil society organisations (CSOs)** are well positioned to make use of their unique flexibility, focused mission, and often their proximity to the energy poor to promote community dialogue, engagement, and support. Leading global organisations can participate in multi-stakeholder sectoral initiatives, either on their own initiative or in collaboration with businesses. In the transport sector, for example, CSOs could lead a global campaign on “eco-driving” to change driver behaviour. To spur capacity building, CSOs can provide training programmes to help communities implement sustainable energy initiatives, such as electrifying villages through solar power. They can identify technology and supply chain gaps that are crucial to scale up and help address them. Where mini-grid or off-grid solutions are appropriate, CSOs can offer innovative mechanisms to lower up-front costs to consumers and develop business models and supply chains that attract investment, delivering energy access in areas where fully commercial approaches lag
- 2.8 **Collaborations among these stakeholders will take many different forms and cut across all sectors.** Examples could include international financial institutions providing risk guarantees to private investors; policy makers and civil society groups working together to set standards and ensure product quality; mobile phone companies partnering with national utilities to make electricity affordable to the very poor; transportation and urban planners jointly designing low-carbon cities; and volunteer experts around the world sharing best practices with policy makers who are new to the field. The opportunities are as diverse as are the ways to produce and use energy.

# 3

## IMPLEMENTATION ROADMAP

### MAKING IT HAPPEN: METRICS OF PROGRESS

- 3.1 **The Sustainable Energy for All initiative seeks to improve the lives of billions of people across the world and ensure a more sustainable future by transforming the world's energy systems.** Because access to energy is an essential means of supporting societal progress, rather than an end in itself, the energy transformation must be coordinated with social, economic, and environmental development.
- 3.2 **Achieving this transformation by 2030 requires both short-term and long-term progress metrics.**
- *The short-term* need is to raise the global profile of the initiative. This can be achieved by mobilising a set of first-mover countries, along with commitments to action from leading businesses, to show what is possible.
  - *The long term* need is for an effective coordination structure that can sustain momentum over the next two decades and mainstream the initiative's core objectives in political and business decisions.
- 3.3 **Metrics of progress should cover both the Action Areas and supporting activities. They must be fully developed going forward and should be designed to promote transparency about the initiative's progress, while also engaging the global public.**

*Indicators of progress could include:*

- **Accelerating country action**, as measured by participation, policy and regulatory change, and the number of additional beneficiaries.
- **Driving sectoral action**, as measured by the number of stakeholders and the resources mobilised for high-impact opportunities, as well as the coverage and diversity of actors and initiatives.
- **Developing enabling action**, as measured by the amount of private investment leveraged by the public resources, the level of capacity developed, and the extent of knowledge sharing.

*Supporting activities indicators include:*

- **Promoting accountability and transparency** based on regular **monitoring of progress** through simple but credible success metrics.
- **Mobilising global public engagement** by raising awareness about the objectives of Sustainable Energy for All and continually expanding outreach to stakeholders.



Table 1: Illustrative Action Area metrics toward Sustainable Energy for All

ACTION AREAS	IMMEDIATE TERM	SHORT TERM	LONGER TERM
	(by Rio+20)	(to 2015)	(2015 to 2030)
<b>Country action</b>	<p><b>Developing countries:</b> Development/updating of national energy action plans initiated</p> <p><b>Developed countries:</b> Political support mobilised for domestic and international action toward the Sustainable Energy for All objectives</p>	<p><b>Developing countries:</b></p> <ul style="list-style-type: none"> <li>National and regional energy action plans in place to achieve tailored objectives</li> <li>National capacities and policies strengthened for investment readiness</li> <li>Active energy programmes in place with sufficient investment</li> </ul> <p><b>Developed countries:</b></p> <ul style="list-style-type: none"> <li>Policies and programmes in place to make progress toward tailored objectives</li> </ul>	<p><b>Appropriate policies,</b> legal, fiscal and regulatory frameworks, and standards implemented at all levels and across all sectors to achieve nationally tailored objectives</p> <p><b>Significant number of people newly gained access</b> to modern energy services</p>
<b>Sectoral action</b>	<p><b>Flagship initiatives</b> initiated in each Action Area, led by multiple stakeholders (businesses, CSOs, governments)</p>	<p><b>Measurable progress</b> on flagship initiative</p> <p><b>Substantial growth</b> in the number of actions under way</p> <p><b>Key cross-sectoral opportunities</b> identified (e.g., water and energy)</p> <p><b>Increasing uptake</b> by SMEs / grassroots CSOs / local governments / municipalities</p>	<p><b>Initiatives</b> incorporated in continual improvement process</p> <p><b>Growing investment</b> (all areas)</p> <p><b>Institutional and financial capacity</b> to sustain efforts continually strengthened</p>
<b>Enabling action</b>	<p><b>Resources</b> committed to enable country actions and flagship activities (including technical assistance resources)</p> <p><b>Knowledge management networks</b> / infrastructure designed</p>	<p><b>Predictable financing instruments</b> established to support initiatives requiring public / donor finance</p> <p><b>Knowledge management networks</b> in place, including global best practice databases and tools enhanced for easy access</p> <p><b>Ready access to experts</b> to provide technical support for policy creation</p>	<p><b>Private financing</b> leveraged by public resources, commensurate to the level required for meeting Sustainable Energy for All objectives at all levels</p>

Table 2: Illustrative supporting activities metrics toward Sustainable Energy for All

SUPPORTING ACTIVITIES	IMMEDIATE TERM	SHORT TERM	LONGER TERM
	(by Rio+20)	(to 2015)	(2015 to 2030)
<b>Accountability and monitoring mechanisms</b>	<p><b>Accountability framework</b> in place to measure progress of individual initiatives and overall objectives</p>	<p><b>Tracking /publishing of progress</b> by all participating stakeholders (i.e., governments, businesses and CSOs).</p> <p><b>Transparent and accessible platform</b> in place for self-reporting on fulfilment of commitments to action</p>	<p><b>Institutional feedback loops</b> created between the monitoring and reporting of progress and strategic planning processes</p> <p><b>Progress updates</b> incorporated in routine reporting processes</p>
<b>Public engagement</b>	<p><b>Messaging developed</b> and awareness campaign launched</p>	<p><b>Increased web presence,</b> continued growth in public awareness</p>	<p><b>Targeted effort launched</b> to reach groups in need of specific support</p>

## ACCELERATING GLOBAL MOMENTUM

- 3.4 **The Sustainable Energy for All initiative will sustain and accelerate global momentum if individual actions at all levels can be effectively linked with its ambitious global objectives.** To maintain momentum and focus, two activities are needed: (1) tracking global progress toward the three core objectives; and (2) using regular assessments to spark continued global dialogue.
- 3.5 **Both stakeholders and observers must be able to assess global progress and measure and recognize success at all levels of the “vision pyramid”** (shown in Figure 3). Such assessments can be built on existing data collection, reporting processes, and initiatives to improve measurement tools (e.g., by the IEA, World Bank, ESMAP, UN), but more data is needed. Tracking and meeting the progress metrics discussed above will ensure that the initiative is moving forward. Individual commitments to action and high-impact opportunities will have their own milestones. At the same time, and more importantly, an overall assessment of progress toward the three objectives—energy access, share of renewables, and rate of energy efficiency improvement—will be needed so that it is clear where we stand, how much remains to be accomplished, how individual actions are contributing, and where more action is needed. This assessment should be carried out at two levels:
- **At the global level**, disparate analyses will need to be assembled and consolidated to assess the reach of energy access, the share of renewables, and the rate of improvement of energy efficiency to assess whether the world is on track to achieve the objectives of Sustainable Energy for All. Such global tracking can be presented visually (e.g., through a Sustainable Energy for All “ticker”).
  - **At the Action Area level**, specific metrics will need to be used to assess whether sufficient progress is being made relative to the potential contribution of each Action Area, and highlighted on knowledge sharing platforms.
- 3.6 **Tracking progress toward Sustainable Energy for All will prompt a continued global dialogue.** Each global progress assessment will renew debate about the pace and scale of change. The Sustainable Energy for All initiative must facilitate this conversation at all levels and across all stakeholders. Doing so will ensure that the initiative continues to draw the focused attention and discourse of governments, the private sector, and civil society.
- 3.7 **This continued dialogue will provide a basis for regularly updating the Action Agenda, which should be viewed as a living and evolving document.** Results of the global assessment will enable participants and other stakeholders to revisit the Action Agenda and refine and steer its priorities to address changing needs at the national and global levels, helping to ensure that the initiative remains relevant and effective from now until 2030.

*“Supplying modern energy services to the billions who now lack electricity and clean fuels is not just a moral imperative but a unique business opportunity—a huge market in itself and one that will create new levels of prosperity and demand for goods and services of all kinds.”*

*— Chad Holliday and Kandeh Yumkella, Co-Chairs of the High-level Group on Sustainable Energy for All*

*“We need innovation to spread throughout the world—especially where energy demand is growing fastest. We need partnerships with the private sector, the global engine of growth and the primary source of new investments.”*

*— Ban Ki-moon, Secretary-General of the United Nations*

# 4

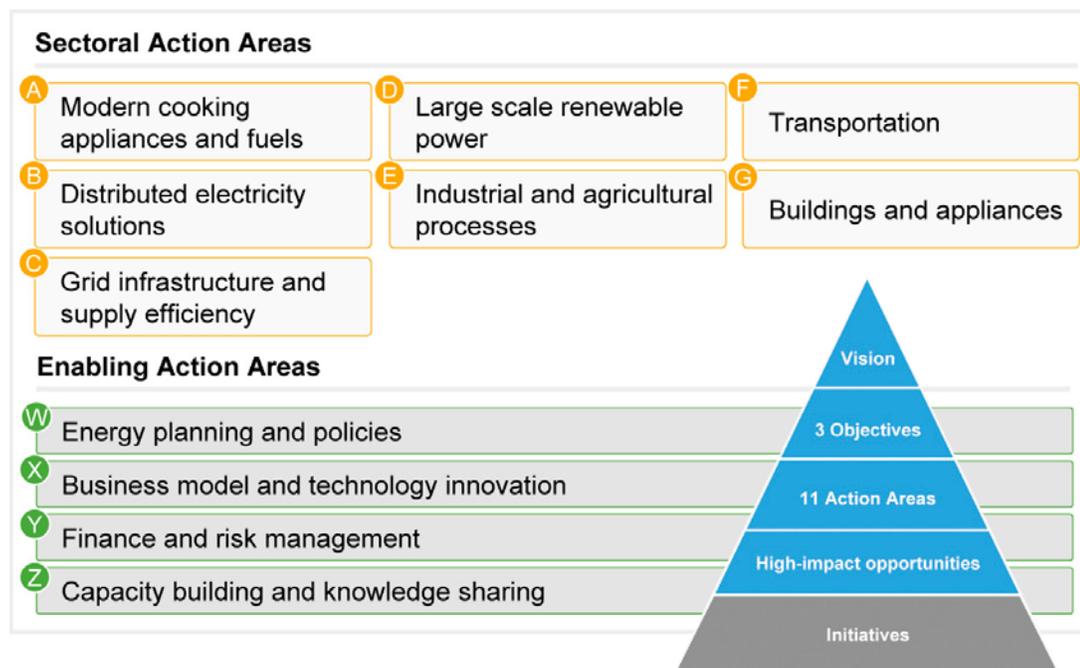
## MOBILISING ACTION

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- 4.1 **Mobilising action from all stakeholders is at the heart of the Sustainable Energy for All initiative**, since only engaged stakeholders can take the concrete steps needed to achieve the three core objectives. Thus, the success of the initiative hinges on its ability to secure commitments to action, effect changes in the parameters for action, and promote successful outcomes through effective and transparent accountability mechanisms. The Secretary-General will use his convening power to mobilise action by stakeholders and build and leverage a global network to drive the initiative.
- 4.2 **Members of the High-level Group and their partners are reaching out to their sectoral and geographic networks to catalyse and accelerate collaborative action and bring scale to the process.** In the short term, the focus is on engaging a wide variety of global stakeholders to make commitments to action on high-impact opportunities. In addition, the UN Global Compact is involving a large number of companies and relevant industry associations through their global and national networks. These efforts seek to strengthen existing initiatives by all partners to mainstream sustainable energy concerns into their programmes, identify new opportunities, and develop individual actions and collaborative partnerships for action.
- 4.3 **Scaled-up efforts to achieve Sustainable Energy for All will require effective coordination capacity at the global and national levels, as well for specific actions, to ensure continued engagement and effective delivery throughout the life of the initiative.** Operational arrangements should leverage existing institutional structures, taking full advantage of available delivery mechanisms and the diverse capacities of a network of partners, including international organisations, businesses, and civil society organisations. Key functions to be addressed include strategic planning; facilitating multi-stakeholder dialogue; coordinating country action and high-impact opportunities; supporting policy analysis, knowledge management, technical advisory services, and communications; monitoring, reporting and accountability; and mobilising partnerships and resources. Such operational arrangements need to be formalised in the short to mid term to support continued engagement over the life of the initiative.
- 4.4 **Achieving the three objectives is within reach if all stakeholders come together and act.** This Action Agenda builds on an emerging groundswell of international support for change. Governments, businesses and civil society organizations have already taken important steps. The Sustainable Energy for All initiative will ensure that these leaders are joined in a broader global movement to provide economic opportunity, protect the global environment, and enhance equity.
- 4.5 **Sustainable Energy for All is a call to action for our collective future.** Working together, we can achieve a broad-based transformation of the world's energy systems over the next 20 years and build a better world for our children and for generations yet to come.

# ACTION AREA ILLUSTRATIONS

- **This section describes the Action Areas in more detail**—which objectives they primarily address and what set of key actions they include.
- **For each area, examples of high-impact opportunities around are presented**, around which actions can be mobilized and coordinated for maximum impact. High-impact opportunities can take the form of technology development and deployment, policies, institutional building, or the removal of barriers. New high-impact opportunity areas will be added when and as needed.
- **Lastly, examples of existing initiatives are provided**, linked to one or more high-impact opportunities. These examples illustrate the kinds of actions, investments, and stakeholder engagement that the Sustainable Energy for All initiative seeks to catalyse and build upon. These examples are not meant to be comprehensive; rather, they are presented for illustrative purposes only, based mainly on contributions from High-level Group members.
- **The section should be used as a tool**
  - **For governments:** to provide a diagnostic assessment of what areas their country has already addressed and identify where further action can be taken.
  - **For businesses:** to spot opportunities for action and investments.
  - **For civil society organisations:** to identify opportunities for renewed focus and effort, for coordination with other stakeholders, and for scaling up existing programmes.



## (A) MODERN COOKING APPLIANCES AND FUELS

### CONTEXT

The Action Area of ‘modern cooking appliances and fuels’ supports the initiative’s objective of “ensuring universal access to modern energy services” for the 2.7 billion people who currently rely on polluting and inefficient stoves and fuels for cooking. Increased deployment and use of clean and efficient stoves and fuels will save lives, improve livelihoods, empower women, and combat climate change.

This Action Area includes all options that enable households to shift to cleaner fuels and stoves, including cookstoves fuelled by cleaner fuels such as biogas, solar, ethanol, propane, or liquid petroleum gas (LPG), and advanced biomass cookstoves. Extending access to clean cooking fuel leads to a four- to five-time increase in energy efficiency for cooking services. The IEA’s *World Energy Outlook 2011* estimates that \$74 billion in cumulative additional investment will be needed to provide universal access to modern cooking facilities by 2030. The report estimates that such stoves will burn biogas (~50%), LPG (~25%), and biomass (~25%).

<b>HIGH-IMPACT OPPORTUNITIES IN THIS ACTION AREA:</b> Ex. A1) Action to be taken <i>(primary stakeholder to drive opportunity, if relevant)</i>	Governments	Donors	Businesses	Civil Society
A1) <b>Develop industry standards for efficiency, safety, and emission reduction</b> , based on testing and certification <i>(Global Alliance for Clean Cookstoves, stove manufacturers)</i>	■	■	■	■
A2) <b>Advocate for and educate consumers about the importance and health economic, environmental, and gender benefits of clean cooking</b> through capacity building, awareness campaigns and women’s networks	■	■	■	■
A3) <b>Develop more efficient stoves and design products that meet consumer demand</b> <i>(stove manufacturers, women’s groups, and researchers)</i>	■	■	■	■
A4) <b>Implement policy frameworks, train entrepreneurs and develop sustainable value chains and robust infrastructure</b> for clean and efficient cookstoves and fuels	■	■	■	■
A5) <b>Develop financing schemes</b> to provide credit to households that cannot afford the up-front costs for efficient biomass stoves, LPG burners and other modern cooking equipment	■	■	■	■

Other relevant high-impact opportunities can be found under ‘Enabling Action Areas’—e.g., national policies, finance, capacity building, and business models.

**Examples of initiatives that could fall into this Action Area are:** the ACP-EU Energy Facility and the Global Alliance for Clean Cookstoves, led by the United Nations Foundation, which has six objectives: (1) catalyze the sector and broker partnerships, (2) promote international standards and testing, (3) champion the issue, (4) coordinate sector knowledge and research, (5) enable markets, and (6) mobilize resources.



## (B) DISTRIBUTED ELECTRICITY SOLUTIONS

### CONTEXT

The Action Area of ‘distributed electricity solutions’ supports the initiative’s energy access objective for the 1.3 billion people who currently lack access to electricity and for another billion people who have power only intermittently. It complements the Action Area on ‘grid infrastructure and supply efficiency’.

This Action Area includes all distributed options for electrification, which range from island-scale grid infrastructure to mini-grids to much smaller off-grid decentralised individual household systems. Ultimately some of these systems may be connected to the grid. Distributed electricity solutions are essential for those regions that rely on fuel imports for energy (e.g., islands) and will not be connected to the grid in the foreseeable future. Experience has shown the best progress has come in developing countries that pursued strategies and policies to expand access to all (i.e., both urban and rural communities) by including the full range of electrification options in a balanced way. The *World Energy Outlook 2011* concludes that grid extension is the best option for achieving universal access in all urban areas but in only 30% of rural areas. The IEA projects that around 45% of the additional connections needed for universal access will come from grid expansion, while the remaining 55% will depend on micro-grids and off-grid solutions.

HIGH-IMPACT OPPORTUNITIES IN THIS ACTION AREA:	Governments	Donors	Businesses	Civil Society
<b>B1) Provide regulatory support for scalable and sustainable business and financial models</b> for existing options such as:				
• solar home system development and deployment (including consumer financing)				
• clean energy mini-/micro-grid solutions using both renewables and conventional sources for rural applications, health care settings, solar-powered street lighting and energy for small businesses and agricultural purposes.				
• lighting, charging, and basic electrification				
• self-contained systems that provide uninterrupted power when the grid fails				
<b>B2) Recognize consumer needs and provide distributed electricity solutions that support productive use and economic development</b> through local business creation				
<b>B3) Train local citizens</b> to sell and service distributed electricity solutions <b>and create viable supply chains</b> for upgrading and maintenance				
<b>B4) Develop and implement small-scale renewable energy and smart grid solutions</b> for areas where conditions do not allow for large-scale interconnected grids, such as islands or remote areas				
<b>B5) Develop minimum national and regional performance standards for energy products,</b> based on government testing, labelling, and certification ( <i>governments and manufacturers</i> )				

*Other relevant high-impact opportunities can be found under ‘Enabling Action Areas’—e.g., national policies, finance, capacity building, and business models.*

**Examples of initiatives that could fall into this Action Area are:** Global LEAP; Lighting Africa and Lighting Asia, driven by the World Bank and IFC; Lighting a Billion Lives under TERI; the World Bank’s Renewable Energy for Rural Economic Development programme in Bangladesh and Sri Lanka; regional development banks’ distributed energy projects such as those promoted under “Energy for All” by ADB and by AfDB under the Scaling-Up Renewable Energy Programme in Low Income Countries; ACP-EU Energy Facility; the Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project of UNDP/GEF; the Climate Institute’s Global Sustainable Energy Islands Initiative; IRENA’s Initiative on Renewables and Islands; and the Small Island Developing States (SIDS) Sustainable Energy Initiative.

## (C) GRID INFRASTRUCTURE AND SUPPLY EFFICIENCY

### CONTEXT

The Action Area of ‘grid infrastructure and supply efficiency’ supports the initiative’s energy access objective for the 1.3 billion people currently without power and for another billion people who have power only intermittently. It is equally critical to delivering ‘large-scale renewable power’. It also complements the Action Area on ‘distributed electricity solutions’ and advances the energy efficiency objective in the electricity supply sector.

This Action Area includes: expansion of grid infrastructure to areas or people without access to electricity; reinforcing transmission and distribution infrastructure so as to reduce losses and improve reliability; measures that increase the efficiencies of energy generation and supply infrastructure (e.g., improving the thermal efficiency of power plants), and smart grid solutions and grid-scale storage that would improve the efficiency of advanced grids. The IEA’s *World Energy Outlook 2011* concludes that centralised grid extension is the best option for achieving universal access in all urban areas but in only 30% of rural areas. The IEA projects that roughly 45% of the additional connections needed for universal access will come from grid expansion, while the remaining 55% will depend on micro-grids and off-grid solutions.

HIGH-IMPACT OPPORTUNITIES IN THIS ACTION AREA:	Governments	Donors	Businesses	Civil Society
C1) <b>Improve capabilities and methodologies</b> to make informed assessments of optimal grid infrastructure coverage, expansion, and reliability to serve local circumstances				
C2) <b>Develop and disseminate existing and new approaches and equipment for expanding the grid</b> to larger areas in a cost-efficient manner, while also strengthening and improving the reliability of existing infrastructure ( <i>utilities, technology providers</i> )				
C3) <b>Improve smart grid technology solutions, grid-scale storage, and interactions between renewables and fossil fuels</b> to reduce grid losses and support generation from intermittent renewable resources and new load patterns from consumers ( <i>technology providers, utilities</i> )				
C4) <b>Build sufficient local and regional implementation capacity</b> to expand grid to new areas and reinforce it where demanded				
C5) <b>Expand national / regional integration of generation and transmission projects</b>				
C6) <b>Establish efficiency targets for existing and new generation assets</b> and develop technologies and approaches to reach them ( <i>governments, utilities, technology providers</i> )				
C7) <b>Support forecasting of renewable power sources</b> to facilitate integration into the grid and plan for environmentally and economically efficient back-up capacity				
C8) <b>Implement transparent transmission/distribution costing mechanisms</b> that drive energy efficiency, and offer a level playing field for connecting energy sources to the grid				

Other relevant high-impact opportunities can be found under ‘Enabling Action Areas’—e.g., national policies, finance, capacity building, and business models.

**Examples of initiatives that could fall into this Action Area are:** Energy for All by the Asian Development Bank (also working on clean cooking and off-grid power); the Africa-EU Infrastructure Trust Fund, and several rural access projects of the World Bank in Africa; examples of successful grid expansion can be found in many countries (e.g., Brazil, China, South Africa, and Vietnam); the Programme for Infrastructure Development in Africa (PIDA); and regional transmission projects being proposed across Africa.



## (D) LARGE-SCALE RENEWABLE POWER

### CONTEXT

The Action Area of ‘large-scale renewable power’ supports the Secretary-General’s objective of “doubling the share of renewable energy in the global energy mix.” Large grid-scale power transmission is essential, especially in those regions where electricity demand growth is located away from the most abundant renewable resources. Currently 19 percent of the world’s electricity generation comes from renewable sources (primarily hydropower).

The investments needed for this Action Area are so substantial that the private sector and global financial markets must play a key role. Enabling policy frameworks are critical to make these investments happen. This Action Area includes: options to accelerate the deployment of all renewable technologies, including onshore and off-shore wind, solar PV, solar thermal including concentrating solar power, geothermal, hydro, and biomass; the research and innovation needed to continue pushing down the cost of these technologies; specific policies and business models to support them (e.g., feed-in tariffs and public auctions); and the removal of barriers to large-scale renewables.

HIGH-IMPACT OPPORTUNITIES IN THIS ACTION AREA:	Governments	Donors	Businesses	Civil Society
D1) <b>Improve and disseminate resource assessment methodologies and develop technical assistance capacity</b> to help countries map resource availability and develop expansion plans	■	■	■	■
D2) <b>Share and develop innovative, increasingly cost-effective design and deployment approaches</b> ( <i>technology providers</i> )	■	■	■	■
D3) <b>Craft robust renewables policies and power-price purchase agreements</b> on which renewables developers, utilities and business can rely	■	■	■	■
D4) <b>Coordinate grid-connected infrastructure strategies</b> so that different renewable energy project developers do not run into the same barriers	■	■	■	■
D5) <b>Develop capacity for installation, operating and maintenance</b> to ensure long-term technical and economic success	■	■	■	■
D6) <b>Adopt procurement policies and targets</b> that stimulate demand for renewables	■	■	■	■
D7) <b>Develop checklists and toolboxes</b> that allow national policy makers to effectively address the different procedural aspects required to introduce large-scale renewables into the grid	■	■	■	■
D8) <b>Develop monitoring and best-practice sharing facilities</b> and similar mechanisms to spur progress	■	■	■	■

*Other relevant high-impact opportunities can be found under ‘Enabling Action Areas’—e.g., national policies, finance, capacity building, and business models.*

**Leading examples of renewables scale-up efforts** can be found across many developed and developing countries and regions. For developing countries these include: the Paris-Nairobi Climate Initiative & EU-Africa Energy Partnership; the Africa-EU Infrastructure Trust Fund; the Climate Investment Funds (including the Clean Technology Fund and Scaling-up Renewable Energy Programme in Low Income Countries); the World Bank’s Energy Sector Management Assistance Programme; the Climate Institute’s Global Sustainable Energy Islands Initiative; the Global Bioenergy Partnership; and the Clean Energy Ministerial initiative on the Sustainable Development of Hydropower. Examples of large-scale renewables projects in developing countries can be found in Brazil, Ethiopia, Kenya, Morocco, and South Africa, to name a few.

## (E) INDUSTRIAL AND AGRICULTURAL PROCESSES

### CONTEXT

The Action Area of ‘industrial and agricultural processes’ addresses the energy efficiency and renewables objectives of Sustainable Energy for All, while the access objective is addressed by the agricultural process sub-area—through the integrated production of food and energy in the agrifood chain. The industry and agriculture sectors represent 20% of today’s global primary energy demand, according to the *World Energy Outlook 2011*, with their combined share projected to grow a little to 22% by 2030. Including the indirect consumption of energy through the use of electricity, their share rises to 28%. Both heat and electricity are required in industrial processes. The potential for renewables as feedstock and heat source is large, especially in combination with energy efficiency options. Modern agrifood and agri-industry systems are more than 70% dependent on fossil fuels, and it is estimated that 30% of the food produced globally is wasted, which entails significant embedded energy losses.

This Action Area thus includes opportunities to: improve the efficiency of business operations and product design; reduce energy consumption and wasteful practices along the value chain; capture and recycle waste heat; as well as use renewable energy sources in industrial and agricultural processes.

HIGH-IMPACT OPPORTUNITIES IN THIS ACTION AREA:	Governments	Donors	Businesses	Civil Society
E1) <b>Adopt targets and trajectories for the energy efficiency of products and services</b> , using a life-cycle perspective				
E2) <b>Advocate for strong government efficiency standards</b> , develop monitoring mechanisms, and educate consumers and business				
E3) <b>Share and apply best practices in operations</b> to improve energy productivity and incorporate renewables				
E4) <b>Deploy and scale up energy management systems</b> and tools for reducing energy use				
E5) <b>Capture and redeploy wasted energy and heat</b> , including natural gas that is now burned off through ‘flaring’				
E6) <b>Convert to biomass and other renewable sources in industrial processes</b> where possible and sustainable over the longer term, including for co-generation				
E7) <b>Provide sustainable energy access to agriculture and SMEs</b>				
E8) <b>Address the energy-water nexus</b> through renewables-based desalination and energy-efficient irrigation pumps				
E9) <b>Improve access to modern energy services</b> through integrated food and energy production				

*Other relevant high-impact opportunities can be found under ‘Enabling Action Areas’—e.g., national policies, finance, capacity building, and business models.*

**Examples of initiatives that could fall into this Action Area are:** The World Bank’s Global Gas Flaring Reduction (GGFR), a public-private partnership with support from Statoil, among others; an upcoming FAO-led Multi-Partner Programme on “Energy-Smart Food for People and Climate”; a UNIDO-led Green Industry Initiative; WBCSD’s Cement Sustainability Initiative; CEM’s Global Superior Energy Performance Partnership (GSEP); IPEEC’s Energy Management Action Network for Industrial Efficiency; the Cogen Africa programme by AfDB; ISO 50001; Institute of Industrial Productivity’s Best Practice Guidelines; and numerous best-practice efforts within individual industries (e.g., compiled by the UN Global Compact).



## (F) TRANSPORTATION

### CONTEXT

The Action Area of ‘transportation’ supports the efficiency and renewables objectives of Sustainable Energy for All. Transportation accounts for more than 27% of final energy consumption worldwide (~46 million barrels of oil per day). By 2030, global consumption is estimated to increase by 60% to 90%, primarily due to increasing road freight traffic and passenger vehicles. The average rate of fuel economy improvement in personal vehicles across OECD countries was 2.2% per year from 2005 to 2008, whereas fuel efficiency *decreased* in developing countries by 0.7% in the same period. Targets for further improvements are, and need to be, substantially higher and impact all markets. Currently renewable biofuels account for about 2 % of the energy used for transport, and electric vehicles power less than 0.1% of global transport. The *Global Energy Assessment* estimates that 70-80 exajoules per year of efficiency savings are achievable in this sector by 2030. Approximately one third of these gains can come from technological efficiencies (e.g., improvements to engines and vehicle design or the use of electric vehicles). Two thirds of the total opportunity is available through avoided demand (e.g., driving less, traffic management).

This Action Area includes all options that improve efficiency and reduce fuel consumption per distance travelled, that shift fuel demand to sustainable biofuels or electric power trains, that promote modal shifts to less polluting and more efficient transportation means, and that reduce demand for transportation services.

HIGH-IMPACT OPPORTUNITIES IN THIS ACTION AREA:	Governments	Donors	Businesses	Civil Society
F1) <b>Implement or increase fuel standards</b> for internal combustion engine vehicles	Orange	Orange	Orange	Orange
F2) <b>Expand the use of alternative fuel vehicles</b> (e.g., natural gas vehicles, flex-fuel vehicles, electric power trains, etc.)	Orange	Orange	Orange	Orange
F3) <b>Improve and scale up the use of sustainable first- and second-generation biofuels</b> without impinging on food and water security ( <i>fuel suppliers and researchers</i> )	Orange	Orange	Orange	White
F4) <b>Invest heavily in public transportation infrastructure</b> to increase its use	Orange	White	White	Orange
F5) <b>Educate drivers on fuel-efficient driving</b> (eco-driving) and encourage on-board use of eco-mode functions	Orange	White	Orange	Orange
F6) <b>Offer ability to tele-commute</b> to employees to reduce driving demand ( <i>employers</i> )	Orange	Orange	Orange	Orange
F7) <b>Plan transit-oriented developments</b> so residents can either walk or easily take public transit ( <i>urban planners and real estate developers</i> )	Orange	White	White	White
F8) <b>Develop and adopt more efficient ship designs</b> with new propulsion and combustion systems or that use renewable fuels ( <i>technology providers and shipping companies</i> )	Orange	White	Orange	White
F9) <b>Adopt new fuels and fuel-efficient aircraft designs</b> ( <i>airlines, aircraft manufacturers</i> )	Orange	White	Orange	White

Other relevant high-impact opportunities can be found under ‘Enabling Action Areas’—e.g., national policies, finance, capacity building, and business models.

**Examples of initiatives that could fall into this Action Area are:** the 50by50 Global Fuel Economy Initiative with many stakeholders (UNEP, IEA, ITF, FIA Foundation, ICCT); the Electric Vehicle Initiative under the Clean Energy Ministerial; the UK’s Low Carbon Vehicle Partnership; the International Air Transport Association’s fuel conservation and efficiency programmes; and the Global Bioenergy Partnership. Examples of countries with successful vehicle fuel economy standards and/or policies to promote switching to sustainable bioethanol include Brazil, the EU, Japan, South Korea, China, and the United States (California).

## (G) BUILDINGS AND APPLIANCES

### CONTEXT

The Action Area of ‘buildings and appliances’ addresses the initiative’s objectives of increasing energy efficiency and expanding the share of renewables. The buildings sector is the largest energy consumer of all end-use sectors, accounting for a third of total energy demand. The *Global Energy Assessment* estimates that in industrialised countries with large building stocks, retrofitting the building envelope can decrease current consumption by up to 90%. Appliance efficiency, including lighting, space cooling and heating, and refrigeration, presents an attractive set of opportunities, as nearly all solutions to improve energy efficiency reduce net costs in the long run. In total, potential savings are estimated to be 40 to 50 EJ per year from this sector.

In developing countries, traditional biomass is still one of the most important energy sources for meeting heating and cooking requirements of buildings, and kerosene is used for lighting. Globally, the breakdown of energy sources currently used in buildings is approximately one-third biomass, one-third electricity and heat, and one-third fossil fuels (gas, oil, and coal). Traditional biomass may be phased out with increased urbanisation and development, so the opportunity lies in shifting the mix of electricity and heat to more sustainable energy sources. Urbanisation will also increase the overall energy consumption of cities, particularly when the energy systems used to serve transportation and building end uses are unplanned, uncoordinated, or inefficient. As such, cities provide a number of opportunities for advancing energy efficiency and renewable energy, including municipal water pumping, centralised heating, and street lighting.

HIGH-IMPACT OPPORTUNITIES IN THIS ACTION AREA:	Governments	Donors	Businesses	Civil Society
G1) <b>Enact and enforce stricter building codes and higher appliance energy efficiency standards</b>	Orange	White	White	White
G2) <b>Retrofit municipal and public buildings, street lighting and urban water pumping systems</b> by incorporating efficiency criteria into procurement practices, including energy savings performance contracting	Orange	White	White	White
G3) <b>Address residential retrofit needs</b> by properly valuing energy efficiency and incentivising investment (such as through utility demand-side management programmes, the use of energy service companies, and performance contracting mechanisms)	Orange	White	Orange	Orange
G4) <b>Make effective use of rooftops</b> through the extension of rooftop solar in sunny areas and expanded use of “cool roofs” that employ white paint or reflective tile to limit heating	White	White	Orange	White
G5) <b>Retrofit commercial offices</b> with advanced lighting, electronics, and heating / cooling equipment, and obtain certification under green building standards (e.g., LEED)	White	White	Orange	White
G6) <b>Innovate on technology solutions</b> that improve overall efficiency (energy productivity) and reduce/eliminate standby/phantom electricity losses	Orange	White	Orange	Orange
G7) <b>Deploy and use advanced technologies to enable energy-saving behaviour</b> and raise consumer awareness about simple steps to reduce energy demand from everyday products and through energy efficiency labelling schemes	Orange	White	Orange	Orange
G8) <b>Encourage regulatory phasing out of inefficient appliances, such as incandescent lamps</b>	Orange	White	White	Orange

*Other relevant high-impact opportunities can be found under ‘Enabling Action Areas’—e.g., national policies, finance, capacity building, and business models.*

**Examples of initiatives that could fall into this Action Area are:** The Super-efficient Equipment and Appliance Deployment (SEAD) initiative of the Clean Energy Ministerial and the International and the International Partnership for Energy Efficiency Cooperation; the En.lighten initiative by UNEP and GEF; IEA’s Efficient Electrical End-use Equipment initiative (4E); the Global Building Codes Assistance Project (BCAP); the Energy Efficiency in Buildings project of the World Business Council on Sustainable Development; the World Bank / ESMAP initiative on Public Procurement of Energy Efficiency Services; various smart/ clean/ sustainable/ green/ low-carbon cities initiatives by IRENA, UN-Habitat, UNECE, UNDESA, and industry stakeholders; Global Buildings Performance Network of the Climate Works Foundation; C40; MUNEE (Municipal Network for Energy Efficiency); and the EU Energy Performance Buildings Directive 2010.



## (W) ENERGY PLANNING AND POLICIES

### CONTEXT

The Action Area of ‘energy planning and policies’ supports all three objectives of Sustainable Energy for All. It focuses on creating national energy agendas (or regional/city plans where appropriate) with supportive policies and regulatory frameworks that are clear, transparent, and predictable and that create the right environment for long-term investments, along with robust, effective institutional frameworks. Opportunities in this Action Area could include developing a formal national sustainable energy strategy—ranging from a broad-based energy access strategy to an electricity sector integrated resource plan—aligning standards and targets across levels of government, developing institutional capacity to implement policy change, or using government procurement and other mechanisms to incentivise market transformation.

Country action is one of the first linchpins to the success of Sustainable Energy for All. A precursor to effective action at the country level is a set of well-thought out plans and strategies for attracting, supporting, and streamlining investment. Each country’s plan will be shaped by its own resource endowment, local circumstances and needs (e.g., for some, energy access may be the top priority), but all will support increased action and investment in building energy efficiency and renewable energy.

HIGH-IMPACT OPPORTUNITIES IN THIS ACTION AREA:	Governments	Donors	Businesses	Civil Society
W1) <b>Develop a framework</b> for long-term energy planning, including integrated resource planning, incorporating targets and milestones for renewable energy, energy efficiency, and energy access, and dissemination of existing methodologies and best practices in energy planning.				
W2) <b>Improve and disseminate resource assessment methodologies and develop technical assistance capacity</b> to help countries map resource availability, grid expansion plans, and the need for decentralised electricity solutions				
W3) <b>Actively support international cooperation</b> among governments on a bilateral or multilateral basis, including regional cooperation and market integration				
W4) <b>Develop global and regional technology roadmaps</b> that facilitate international discussion and create specific action points that address opportunities and barriers for renewable energy and energy efficiency applications in end-use sectors				
W5) <b>Create more favourable business environments with appropriately refreshed (or new) policies, regulations, and energy plans</b> to incentivize commercial investments and develop markets (e.g., tariff reforms and regulatory frameworks to promote transparency and efficiency)				
W6) <b>Efficiently mesh project preparation, technical assistance for institutional and regulatory development, and debt/equity financing</b>				
W7) <b>Expand and harmonize financial de-risking mechanisms and tools, such as loan guarantee mechanisms and partial risk guarantee approaches</b>				
W8) <b>Strengthen coordination among private, international and national stakeholders</b> at global, regional and national levels				
W9) <b>Rationalize and phase out inefficient fossil fuel subsidies</b>				

**Existing initiatives that could fall into this Action Area are:** the Global Renewables Resource Map, Renewable Readiness Assessments, and Renewable Energy Scenarios and Strategies by IRENA; IPEEC’s PEPDEE initiative to disseminate best practice in utility-delivered EE programmes, along with regulatory policies that encourage energy providers to implement energy efficiency; technology roadmaps developed by the IEA; the Global Bioenergy Partnership; the Sustainable Development of Hydropower initiative under the Clean Energy Ministerial; the Energy+ international partnership led by Norway, which aims to address energy access, energy efficiency and renewables; West African States energy protocol; the concept city approach of Masdar in the UAE and King Abdullah City for Atomic and Renewable Energy (KACARE) in Saudi Arabia; the Climate Investment Funds under the UN Framework Convention on Climate Change, especially the Clean Technology Funds’ Country-level Clean Energy Investment Plans and the Scaling-up Renewable Energy Programme (SREP) in Low Income Countries; and G-20 and APEC commitments to rationalise/phase out inefficient fossil fuel subsidies.

## (X) BUSINESS MODEL AND TECHNOLOGY INNOVATION

### CONTEXT

The Action Area of ‘business model and technology innovation’ supports all three Sustainable Energy for All objectives. It touches on energy access and renewable energy by making it attractive for the private sector to pursue decentralised electricity solutions in communities or regions that lack access to the grid; it promotes energy efficiency by addressing market failures that prevent individuals and small businesses from adopting energy-saving technologies because of their initial capital costs (for example, through business models that allow utilities to cover the up-front costs of more efficient energy products and recover those costs from users over time). Technology innovation policies are essential to maintain and accelerate technology development and deployment. Basic and applied R&D, demonstration projects, continuous improvement through learning by experience, and efforts to foster partnerships, share information, and support technology and knowledge transfer are needed to accelerate progress.

HIGH-IMPACT OPPORTUNITIES IN THIS ACTION AREA:	Governments	Donors	Businesses	Civil Society
X1) <b>Support the deployment of energy efficiency and energy access solutions</b> , and develop delivery and finance value chains ( <i>local utilities</i> )	■	■	■	■
X2) <b>Undertake match-making between small enterprises and international companies in niche markets</b> , through product purchases, training, supply chain development and supplier credit	■	■	■	■
X3) <b>Develop innovative payment approaches that overcome consumer resistance to high up-front costs</b> for energy-efficient and renewable energy technologies— i.e., a lease/sale approach for energy products, and/or pay-as-you-go mobile payments and engaging local financial institutions in providing end-user finance	■	■	■	■
X4) <b>Organize community-based ownership of those activities</b> that individuals cannot afford but that help the whole community	■	■	■	■
X5) <b>Integrate energy enterprise creation into agriculture and business development activities</b>	■	■	■	■
X6) <b>Provide support for research, development, and demonstration activities</b> in academia, research centres, industry, small and medium enterprises, and local entrepreneurs	■	■	■	■
X7) <b>Promote and support widespread use of new inventions and innovations</b> through competitions to incentivize breakthroughs	■	■	■	■
X8) <b>Launch an Energy Enterprise Portal combining distance learning techniques with local enterprise development expertise</b> to stimulate preparation of multiple investment-grade energy access business plans	■	■	■	■

**Examples of initiatives that could fall into this Action Area are:** E+CO approach to supporting energy entrepreneurs and small-scale business start-ups; the Barefoot College’s concept of community-based training and deployment of solar systems; CleanStar Mozambique’s integrated approach to energy and agribusiness; SELCO Labs’ development of energy solutions that respond to niche consumer needs (e.g., silk worm farmers; midwives).



## (Y) FINANCE AND RISK MANAGEMENT

### CONTEXT

The Action Area of ‘finance and risk management’ supports all three objectives of Sustainable Energy for All. Reaching these objectives by 2030 will require substantial amounts of capital from the public sector, the private sector, and other donors. The *Global Energy Assessment* estimates that annual energy investments will need to increase by about one third from the present \$1.3 trillion per year to \$1.8 trillion per year. More than 75% of this capital will need to come from the private sector. This places additional importance on global capital markets, national banks and financial institutions and their interactions with countries, donors, businesses, and civil society. Mechanisms are needed to accelerate investments, both by leveraging public funds more effectively and by developing sustainable capital markets.

This Action Area includes approaches and instruments to mobilise the amount of capital required, to direct that capital to the appropriate priority opportunities, and very importantly, to reduce the risk of private investment in sustainable energy through the targeted use of philanthropic and public capital and the engagement of local financial institutions.

HIGH-IMPACT OPPORTUNITIES IN THIS ACTION AREA:	Governments	Donors	Businesses	Civil Society
Y1) <b>Use public funds for loan guarantees, risk mitigation, and first-loss protection</b> and establish global monoline insurance support to help address political and policy risk for sustainable energy investments	Orange	Orange	Orange	Orange
Y2) <b>De-risk investment in emerging markets</b> by developing integrated development structures that support local banks and focus on capacity building and financial support for project developers	Orange	Orange	Orange	Orange
Y3) <b>Develop innovative consumer tools</b> such as on-bill financing and PACE (property-assured clean energy) bonds	Orange	Orange	Orange	Orange
Y4) <b>Allocate a portion of investment portfolios to sustainable energy goals</b> , e.g., investing in Sustainable Energy Funds (institutional and philanthropic investors)	White	Orange	Orange	Orange
Y5) <b>Support the creation of “investing groups”</b> and seed capital funds that help increase the pool of “smart” capital available to invest in sustainable energy (investors)	White	Orange	Orange	White
Y6) <b>Support large-scale aggregation and securitization models</b> that target energy efficiency	White	Orange	Orange	White
Y7) <b>Develop a coordination mechanism for sustainable energy finance</b> with the ability to match financing needs emerging from national energy plans with existing sources of philanthropic, public, and private funds	Orange	Orange	Orange	White
Y8) <b>Focus support on funds</b> that target specific sectors that may catalyse progress, such as energy efficiency, with specific tools such as carbon finance or mezzanine debt	Orange	Orange	Orange	White
Y9) <b>Accelerate the development of a Climate Bond market</b> to help drive liquidity and accelerate the take up of clean energy investment by institutional investors	Orange	White	Orange	White

**Examples of initiatives that could fall into this Action Area are:** The Climate Bonds Initiative; GET FiT; the UK’s Capital Markets Climate Initiative; work being done by a range of national development banks such as KfW and BNDES, and by global public financial institutions such as the IFC, the Overseas Private Investment Corporation, ADB, and the World Bank; the UNEP Finance Initiative; the European Investment Bank’s Global Energy Efficiency and Renewable Energy Fund; Sustainable Energy Fund for Africa and Seed Capital Assistance Facility by AfDB; and private companies and investment groups, Climate Technology Initiative/ Private Financing Advisory Network; Global Environment Facility; IFC Partial Credit Guarantee Facility; and the Global Climate Change Alliance.

## (Z) CAPACITY BUILDING AND KNOWLEDGE SHARING

### CONTEXT

The Action Area of ‘capacity building and knowledge sharing’ supports all three objectives of Sustainable Energy for All. It includes a diverse array of programmes: technical assistance to governments, companies and organizations; efforts to build strong local institutions; the gathering and dissemination of knowledge and best practices, including through South-South knowledge exchanges; general advocacy, and consumer education programmes.

As the energy system becomes more complex and interdependent on energy efficiency, newly deployed renewable energy, and the judicious use of fossil-fuel resources, innovative approaches, successful business models, and best practices must be identified to ensure progress can be made at scale. This information must then be made widely known and available so other stakeholders can learn from it. In parallel, training and capacity building must be undertaken with diverse stakeholders in the public and private sectors in both developed and developing countries to ensure that best practices can be adopted efficiently and adapted effectively to local contexts.

HIGH-IMPACT OPPORTUNITIES IN THIS ACTION AREA:	Governments	Donors	Businesses	Civil Society
Z1) <b>Bolster country / regional standards for the use of clean energy technologies</b> through industry groups or advocacy to policy-makers				
Z2) <b>Expand best practices in the supply chain</b> for businesses that have developed clean energy improvements at the firm level				
Z3) <b>Offer transformational courses and degree programmes</b> that link innovation in energy and development ( <i>academia and think tanks</i> )				
Z4) <b>Form partnerships that leverage academic research</b> to innovate and help diffuse and scale up proven technology ( <i>academia and industry</i> )				
Z5) <b>Implement technology-specific peer-to-peer learning and mentoring programmes</b> , fostering exchanges of local innovations and market development techniques				
Z6) <b>Build ‘heat maps’ of critical areas for attention</b> to address problems of energy access and the deployment of energy efficiency and renewable energy				
Z7) <b>Launch communication strategies</b> highlighting entrepreneurship opportunities, policy support mechanisms, sources for technology and access to finance				
Z8) <b>Establish technology development and customisation centres</b> to respond to the technology needs of small, medium and micro enterprises with a view to improving efficiencies and increasing the share of renewables				
Z9) <b>Develop the next generation of in-country / institutional leaders</b> (e.g., through a dedicated Fellows Programme or NREL’s JISEA, focused on training energy analysts)				
Z10) <b>Support the work of consumer organizations</b> in changing markets for energy-using products through consumer education and innovative financing schemes				
Z11) <b>Create an easy-to-use set of policy and planning tools</b> that will facilitate the integrated development of energy sources and supply				

**Existing initiatives that could fall into this Action Area are:** the Clean Energy Solutions Center under the Clean Energy Ministerial; IRENA’s Renewable Energy Learning Partnership; the IEA/IRENA Global Renewable Energy Policies and Measures Database; Renewable Energy and Energy Efficiency Partnership (REEEP); the World Bank Group’s Energy Efficiency Community of Practice and Knowledge Portal; SouthSouthNorth; the Low Carbon Energy for Development Network; ClimateScope by IDB and Bloomberg; Ernst & Young’s Renewable Country Attractiveness Index; and the UN Foundation’s Global Practitioner Network on Energy Access.



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