

**Working Paper**  
**on**  
**International Solar Alliance (ISA)**

The purpose of this Working Paper is to inform about the partnership initiative to establish *International Solar Alliance (ISA)*<sup>1</sup> with membership from the solar resource rich countries lying fully or partially between the Tropic of Cancer and the Tropic of Capricorn. The Working Paper also intends seeking views from, and secure the approval of, solar resource rich countries on the proposed initiative.

There is a gap at present in the application of solar technologies to the very large un-met demand for solar-powered technologies in solar resource rich countries. This gap arises primarily from lack of systematic information about the on-ground requirements as well as scarce opportunities for capacity building and training of users of technologies and finally, a shortage of suitable financing arrangements to make new technologies affordable to very poor users who require them.

The potential energy from sunlight which shines on these countries throughout the year should be harnessed and used to transform lives through simple devices such as solar panels and solar appliances that already exist and need to be scaled up and made accessible where they are needed. This can dramatically improve the quality of life in rural and peri-urban areas that are currently in darkness due to lack of electricity grid. A partnership is proposed, to consist of countries, majority of whom face similar challenges resulting from low rates of energy access-such as farmers who cannot use technology to improve productivity and incomes, or a shortage of clean drinking water due to high costs of purification, or lack of modern healthcare facilities with lighting and refrigeration services, or insufficient numbers of schools with lights, fans and modern equipment. These countries need a voice on the international stage. If they can share their experiences and mobilize in order to close their technological gaps by cooperating with each other, solutions will be found and will also be scaled up leading to lower costs. This cooperation and coordination role is proposed to be filled by ISA, a grouping of countries who are keen to transform their solar resource wealth into improved lives for their people through application of solar technologies.

## **1.0 Background**

1.1 The UN General Assembly Resolution A/RES/36/193 in 1981 underlined the need for cooperation among developing countries and mobilization of financial resources for new and renewable sources of energy. After 2002 UN World Summit on Sustainable Development, many advocacy organizations were set up, primarily to disseminate knowledge about renewable energy. Sustainable Development Goal (SDG) number 7.1, 7.2, 7.a and 7.b clearly state that renewable energy must be given priority in the future agenda of all countries. These read as follows: -

**SDG- 7 : “Ensure access to affordable, reliable, sustainable and modern energy for all”.**

*7.1 By 2030, ensure universal access to affordable, reliable and modern energy services*

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<sup>1</sup> *The name ISA is provisional and subject to change*

7.2 *By 2030, increase substantially the share of renewable energy in the global energy mix*

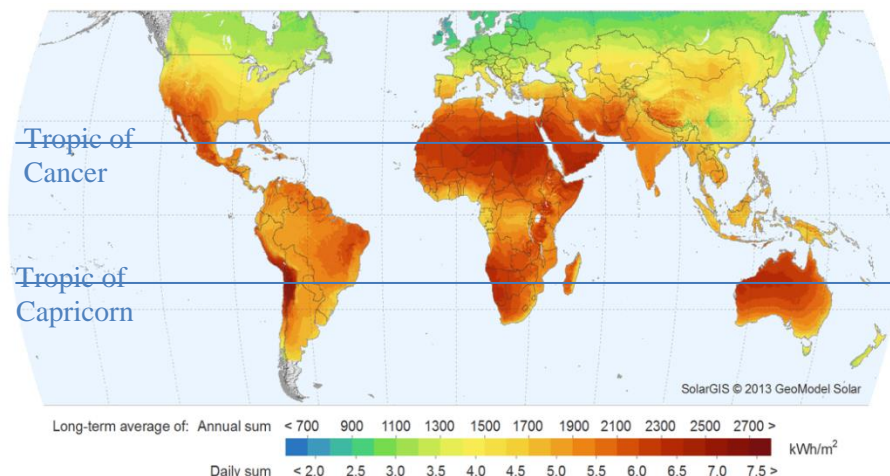
7.a *By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology*

7.b *By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support.*

There are no specialized agencies created under the UN system to promote renewable energy. The gap is partly met by the great work done by International Energy Agency (IEA) and International Renewable Energy Agency (IRENA). There is a clear need for more of such specialized agencies particularly to promote, disseminate and deploy solar energy, which is set to make greater strides among various forms of renewable energy, both due to declining cost and user friendly technologies involved.

1.2 Solar energy technologies have made significant progress and are considered an option for meeting energy needs in a sustainable manner. Countries lying fully or partially between Tropic of Cancer and Tropic of Capricorn are endowed with excellent solar insolation, but the potential remain largely untapped. List of 121 countries lying fully or partially in the region is enclosed at Annexure-I.

1.3 These countries can potentially harness solar energy in a cost effective manner, if a concerted and coordinated effort is made to share experience from other similar countries and concentrate on finding solutions which are designed to be locally appropriate for difficult conditions, while still remaining affordable. Some of these countries lack access to suitably-modified technologies and a shortage of financial resources hampers large-scale deployment. A coalition of these countries for solar energy development and solar technology applications would help in addressing special energy needs of these countries and in the long run reduce reliance on fossil fuels by increasing the share of solar energy in the energy mix. The global solar resource mapping below highlights this point.



1.4 Lack of access is particularly acute in rural areas of many countries, where economic opportunities are few and some coordination to harness the free energy from the sun and combine it with suitable appliances using simple technologies would have the greatest transformative impact on social welfare, in particular for women and girls who currently meet much of the energy requirements through hard ,manual labour, particularly in the household and on the farm.

## **2.0 International Solar Alliance**

2.1 As mentioned above, there is no specific body in place to address the specific solar technology deployment needs of the solar resource rich countries located between the Tropic of Cancer and the Tropic of Capricorn. Most of these countries are geographically located for optimal absorption of the sun's rays. There is a great amount of sunlight year-round which can lead to cost effective solar power and other end uses with high insolation of almost 300 sunny days in a year. Most of the countries have large agrarian populations. Many countries face gaps in the potential solar energy manufacturing eco-system. Absence of universal energy access, energy equity and affordability are issues common to most of the solar resource rich countries.

2.2 International Solar Alliance (ISA ) is conceived as a coalition of solar resource rich countries to address their special energy needs and will provide a platform to collaborate on addressing the identified gaps through a common, agreed approach. It will not duplicate or replicate the efforts that others (like International Renewable Energy Agency (IRENA), *Renewable Energy and Energy Efficiency Partnership (REEEP)*, International Energy Agency (IEA), Renewable Energy Policy Network for the 21st Century (REN21), United Nations bodies, bilateral organizations etc.) are currently engaged in, but will establish networks and develop synergies with them and supplement their efforts in a sustainable and focused manner.

## **3.0 Mission and Vision**

3.1 In the aforesaid background, ISA's Mission and Vision is to provide a platform for cooperation among solar resource rich countries where global community including bilateral and multilateral organizations, corporates, industry, and stakeholders can make a positive contribution to the common goals of increasing utilizing of solar energy in meeting energy needs of ISA member countries in a safe, convenient, affordable, equitable and sustainable manner.

## **4.0 Objectives**

4.1 The overarching objective is to create a collaborative platform for increased deployment of solar energy technologies to enhance energy security & sustainable development; improve access to energy and opportunities for better livelihoods in rural and remote areas and to increase the standard of living.

4.2 ISA will work with partner countries in the identification of national opportunities to accelerate development and deployment of existing clean solar energy technologies, the potential for which largely remains untapped. The increased deployment of solar technologies will benefit the countries in terms of direct and indirect employment opportunities generated and the economic activity that will be triggered through electricity and solar appliance access to predominantly rural households. Across developing countries, it is mostly micro, small and medium enterprises that generate most of the economic activity and are the ones that benefit the most from electricity access, as they will be able to operate into the evening and increase

their turnover. Increased deployment will also go a long way in realizing social benefits, for example through solar lanterns that improve educational outcomes from increased study hours, and lead to better health service delivery levels across communities. If a rural primary health clinic has solar lights, it is more likely to be staffed after dark, and therefore it is also more likely to be visited by those who need its services.

4.3 To achieve the objectives, ISA will have five key focus areas:-

- a. **Promote solar technologies and investment in the solar sector to enhance income generation for the poor and global environment:** Encourage member countries to promote investment in solar technologies/applications in areas of lighting, heating, cooling, distillation, desalination, disinfection, sterilization, pasteurization, pumping, storage, refrigeration, telecommunication, irrigation, drinking water supply, energy efficiency, etc. to promote income and welfare of the poor and make global environment more climate friendly;
- b. **Formulate projects and programmes to promote solar applications:** Together and with partnership of member countries and with cooperation from international organizations, UN member countries, multilaterals, bilaterals, corporates, non-profits, institutions of member and non-member countries of ISA, formulate projects and programmes to ensure solar light for energy deprived households by the year 2022;
- c. **Develop innovative Financial Mechanisms to reduce cost of capital:** Partnering to develop innovative financial mechanism to access low cost, long tenure financial resources from bilateral, multilateral agencies and other sources;
- d. **Build a common Knowledge e-Portal:** Build a knowledge platform, including a 24x7 e-portal for sharing of policy development experiences and best practices in member countries; and
- e. **Facilitate capacity building for promotion and absorption of solar technologies and R&D among member countries:** Promote partnerships among R&D centres of member countries for application oriented research & development and delivering technologies to people as well as capacity building through training & educational programmes and exchange of officials/ entrepreneurs/sector experts/ students/interns/ apprentices, user groups etc.

4.4 These focus areas will cater to not just grid connected solar power (Solar parks, Solar thermal projects, Rooftop solar projects, Canal top projects, Solar on water bodies, Farmers and unemployed youths as generators) but also off-grid and decentralised applications (Village electrification and mini-grids, Solar lanterns, Mobile chargers, Solar powered telecom towers, Milk chilling centres, Potters wheels, Solar spinner for weavers, street lights, Solar pumps, Solar heating/cooling, etc.). These activities will contribute significantly in employment generation in a decentralized manner at the local levels, and also in spurring economic activities.

4.5 To achieve the above overarching objectives, ISA, by way of supplementing the national efforts of the member countries, through appropriate means will undertake following activities:-

- i. Collaborations for joint research, development and demonstration, sharing information and knowledge, capacity building, supporting technology hubs and creating networks;
- ii. Acquisition, diffusion and indigenization and absorption of knowledge, technology and skills by local stakeholders in the member countries;
- iii. Creation of expert groups for development of common standards, test, monitoring and verification protocols;
- iv. Creation of partnerships among country specific technology centres for supporting technology absorption for promoting energy security and energy access;
- v. Exchange of officials/ technology specialists for participation in the training programmes on different aspects of solar energy in the member countries;
- vi. Encourage companies in the member countries to set up joint ventures;
- vii. Sharing of solar energy development experiences, analysis on short- and longer-term issues in key energy supply, financing practices, business models particularly for decentralized applications and off-grid applications, including creation of local platforms focusing on implementation solutions and grass root participation;
- viii. Establish new financial mechanisms to reduce cost of capital in the renewable energy sector and innovative financing to develop; and
- ix. Collaborate with other multilateral bodies like International Renewable Energy Agency (IRENA), *Renewable Energy and Energy Efficiency Partnership (REEEP)*, International Energy Agency (IEA), Renewable Energy Policy Network for the 21st Century (REN), United Nations bodies; bilateral organizations; Corporates, industry, and other stakeholders can contribute towards the goal of increasing utilization of solar energy in ISA member countries.

## **5.0 Governance Structure**

5.1 ISA is proposed to be a multi country partnership organization with membership from solar resource rich countries between the two tropics.

5.2 ISA's proposed governance structure would consist of an Assembly, a Council and a Secretariat. However, it will be subject to member countries' deliberations and suggestions. The Assembly will provide guidance, direction and advice to the Secretariat for undertaking the activities. ISA's detailed statute will be developed in consultation with member countries.

## **6.0 Programmes and projects**

6.1 Multilateral bodies like IRENA, REEEP, IEA, REN21, UN bodies; bilateral organizations; corporates, industry, and other stakeholders will be encouraged to contribute towards the goal of increasing utilization of solar energy in ISA member countries.

6.2 To achieve the goals and objectives, and subject to mutual deliberations, following action points have been identified as short term priorities, to be taken up by ISA:-

- i. Assisting member countries in drafting solar policies;
- ii. E-Portal to offer 24/7 real time suggestions for solar projects;
- iii. Work with ISA member countries to strive for universal access to solar lighting;
- iv. Preparation of Detailed Project Reports and sharing of best-practices and successful case studies;
- v. Exchange best practices and work with member countries in designing financing instruments to mitigate risk and catalyse partnerships to boost investment;
- vi. Share perspectives on developing electricity systems;
- vii. Development of standards, specifications and test protocols for solar energy systems;
- viii. Generate and diffuse key learning on new technologies;
- ix. Encourage collaboration in solar resource mapping in member countries and in deployment of suitable technologies;
- x. Facilitate preparation of plans for solar energy development and deployment;
- xi. Encourage industry cooperation among ISA member countries;
- xii. Forge cooperative linkages on development of Centre of Excellence for R&D in ISA member countries; and
- xiii. Designing training programs for students/engineers/ policy makers, etc. and organizing workshops, focused meetings and conferences.

## **7.0 ISA Secretariat**

7.1 Government of India (GoI) will support ISA by hosting its Secretariat for an initial period of five years and thereafter it is expected to generate its own resources and become self-financing.

7.2 Till a separate infrastructure is created, ISA secretariat will be located in the premises of -

National Institute of Solar Energy (NISE),  
[An autonomous institution under Ministry of New and Renewable Energy]  
19th Milestone, Institutional Area, Gurgaon-Faridabad Road,  
Gwalpahari, Gurgaon [Approx. 25 km from New Delhi]  
Telefax No. : +91-124-2579207

## **8.0 Financial Sustainability**

8.1 The total Government of India support including putting normative cost of the land will be about Rs 400 crore (US\$ 62 million).<sup>2</sup> Government of India support of Rs 175 crore(US\$ 27 million) will be utilized for creating building infrastructure and recurring expenditure. It will be provided over a 5 year period from 2016-17 to 2020-21. The recurring expenditure on ISA will be met from membership fee; contributions from bilateral and multilateral agencies; other appropriate institutions; and also from interest earned from the augmented corpus to be built up with contribution from bilateral, multilateral agencies and

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<sup>2</sup> The exchange rate has been taken as Rs 65 per US dollar.

other appropriate institutions. Until another building is constructed, ISA will also use the newly built “Surya Bhawan” [Sun House] for its operations.

## **9.0 Support for ISA**

9.1 Establishing ISA is contingent upon the willingness and agreement of solar resource rich countries to partner with each other and form the stated Agency. It has the highest level of support from India. Prime Minister of India visualizes ISA as a potent tool for mutual cooperation among the member countries for mutual gains through enhanced solar energy utilization.<sup>3</sup> President of France has welcomed the ISA initiative.<sup>4</sup> IRENA has stated that ISA can provide a unique focus in supporting global efforts to increase the uptake of renewable energy through promotion of applications to reduce poverty and the facilitation of energy access as well as through the development of solar policies.<sup>5</sup> In a meeting on 30 July 2015 the idea received high level support when the Indian Minister for Renewable Energy convened a meeting of representatives of prospective ISA member countries in New Delhi.

9.2 ISA will be instrumental in providing enhanced understanding of the role that solar energy could play in providing energy services, particularly for the rural poor in countries with great solar resource endowments, but who are currently lacking the means to tap this potential energy source and convert it into an opportunity for rural transformation. It will also demonstrate in various ISA partner countries how the widespread usage of solar energy and appropriate technologies and appliances powered by solar energy could reduce cost, save foreign exchange and expand the energy infrastructure without unduly heavy investment. In addition, it will help in contributing towards increased employment generation and promote the transfer of research to industry. More importantly it will act as a voice for raising common issues for development and deployment of solar energy at international fora.

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<sup>3</sup> *There are several countries blessed with high solar radiation. We are making efforts to bring these countries together for enhanced solar energy utilization through research and technology upgradation. These countries have immense strength and capabilities to find solutions for their energy needs through solar energy.* **Narendra Modi, Hon'ble Prime Minister of India**

<sup>4</sup> *I welcome this initiative because if (these) countries can formulate ambitious targets for renewable by modifying regulatory frameworks for financing and improving technologies for lowering price of solar energy, then it will be a major contribution to the implementation of climate agreement.* **Francois Hollande, President of France**

<sup>5</sup> *ISA can provide a unique focus in supporting global efforts to increase the uptake of renewable energy through the development of solar policies, the promotion of applications to reduce poverty and the facilitation of energy access. I welcome this initiative by an IRENA Member Country and the Chair of the IRENA Council, India, and look forward to supporting ISA member countries in all possible ways.* **Adnan Z. Amin, Director General, IRENA**

**List of prospective Member Countries and Territories for ISA**<sup>6</sup>

1.	People's Democratic Republic of Algeria
2.	Antigua and Barbuda
3.	Republic of Angola
4.	Argentina Republic
5.	Commonwealth of Australia
6.	Commonwealth of Bahamas
7.	Peoples Republic of Bangladesh
8.	Barbados
9.	Belize
10.	Republic of Benin
11.	Pluri'National State of Bolivia
12.	Republic of Botswana.
13.	Federal Republic of Brazil
14.	Nation of Brunei, Abode of Peace
15.	Burkina Faso
16.	Republic of Burundi
17.	Kingdom of Cambodia
18.	Republic of Cameroon
19.	Republic of Cape Verde
20.	Central African Republic
21.	Republic of Chad
22.	Republic of Chile
23.	People's Republic of China
24.	Republic of Colombia
25.	Union of Comoros
26.	Congo – Democratic Republic of
27.	Congo - Republic of
28.	New Zealand
29.	Republic of Costa Rica
30.	Republic of Cote d'ivoire
31.	Republic of Cuba

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32.	Republic of Djibouti
33.	Commonwealth of Dominica
34.	Dominican Republic
35.	Republic of Ecuador
36.	Arab Republic of Egypt
37.	Republic of El Salvador
38.	Republic of Equatorial Guinea
39.	State of Eritrea
40.	Federal Democratic Republic of Ethiopia
41.	Republic of Fiji
42.	France
43.	Gabonese Republic
44.	Republic of The Gambia
45.	Republic of Ghana
46.	Republic of Grenada
47.	Republic of Guatemala
48.	Republic of Guinea
49.	Republic of Guinea-Bissau
50.	Republic of Guyana
51.	Republic of Haiti
52.	Republic of Honduras
53.	Republic of India
54.	Republic of Indonesia
55.	Jamaica
56.	Japan
57.	Republic of Kenya
58.	Republic of Kiribati
59.	Laos People's Democratic Republic
60.	Republic of Liberia
61.	Libya
62.	Republic of Madagascar
63.	Republic of Malawi
64.	Federation of Malaysia
65.	Republic of Maldives
66.	Republic of Mali

67.	Republic of Marshall Islands
68.	Islamic Republic of Mauritania
69.	Republic of Mauritius
70.	United Mexican State
71.	Federated States of Micronesia
72.	Republic of Mozambique
73.	Republic of Myanmar
74.	Republic of Namibia
75.	Republic of Nauru
76.	The Netherlands
77.	Republic of Nicaragua
78.	Republic of Niger
79.	Federal Republic of Nigeria
80.	Sultanate of Oman
81.	Republic of Palau
82.	Republic of Panama
83.	Independent State of Papua New Guinea
84.	Republic of Paraguay
85.	Republic of Peru
86.	Republic of Philippines
87.	Republic of Rwanda
88.	St. Lucia
89.	Federation of Saint Kitts and Nevis
90.	Saint Vincent and the Grenadines
91.	Independent State of Samoa
92.	Democratic Republic of Sao Tome and Principe
93.	Kingdom of Saudi Arabia
94.	Republic of Senegal
95.	Republic of Seychelles
96.	Republic of Sierra Leone
97.	Republic of Singapore
98.	Solomon Islands
99.	Federal Republic of Somalia
100.	Republic of South Africa
101.	Republic of South Sudan

102.	Democratic Socialist Republic of Srilanka
103.	Republic of Sudan
104.	Republic of Suriname
105.	United Republic of Tanzania
106.	Kingdom of Thailand
107.	Democratic Republic of Timor-Leste
108.	Togolese Republic
109.	Kingdom of Tonga
110.	Republic of Trinidad and Tobago
111.	Tuvalu
112.	Republic of Uganda
113.	United Arab Emirates
114.	United Kingdom
115.	United States of America
116.	Republic of Vanuatu
117.	Bolivarian Republic of Venezuela
118.	Socialist Republic of Vietnam
119.	Republic of Yemen
120.	Republic of Zambia
121.	Republic of Zimbabwe