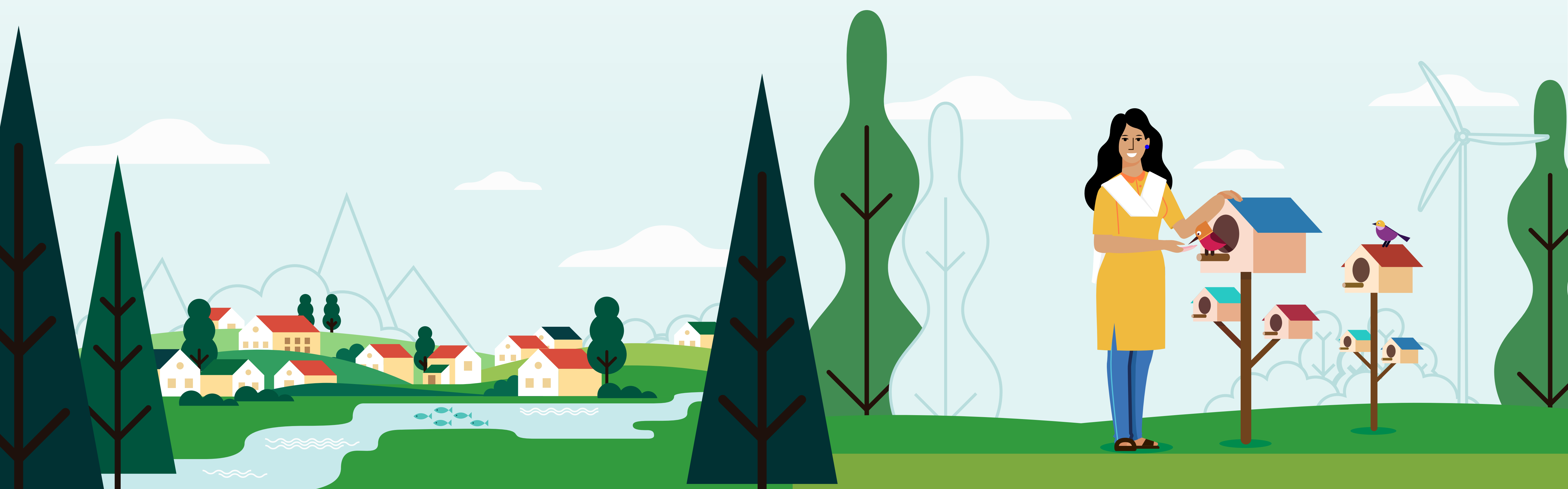
Scaling up Renewable Energy Deployment in India:

Pathways to Reduced Socio-ecological Risks

Executive Summary

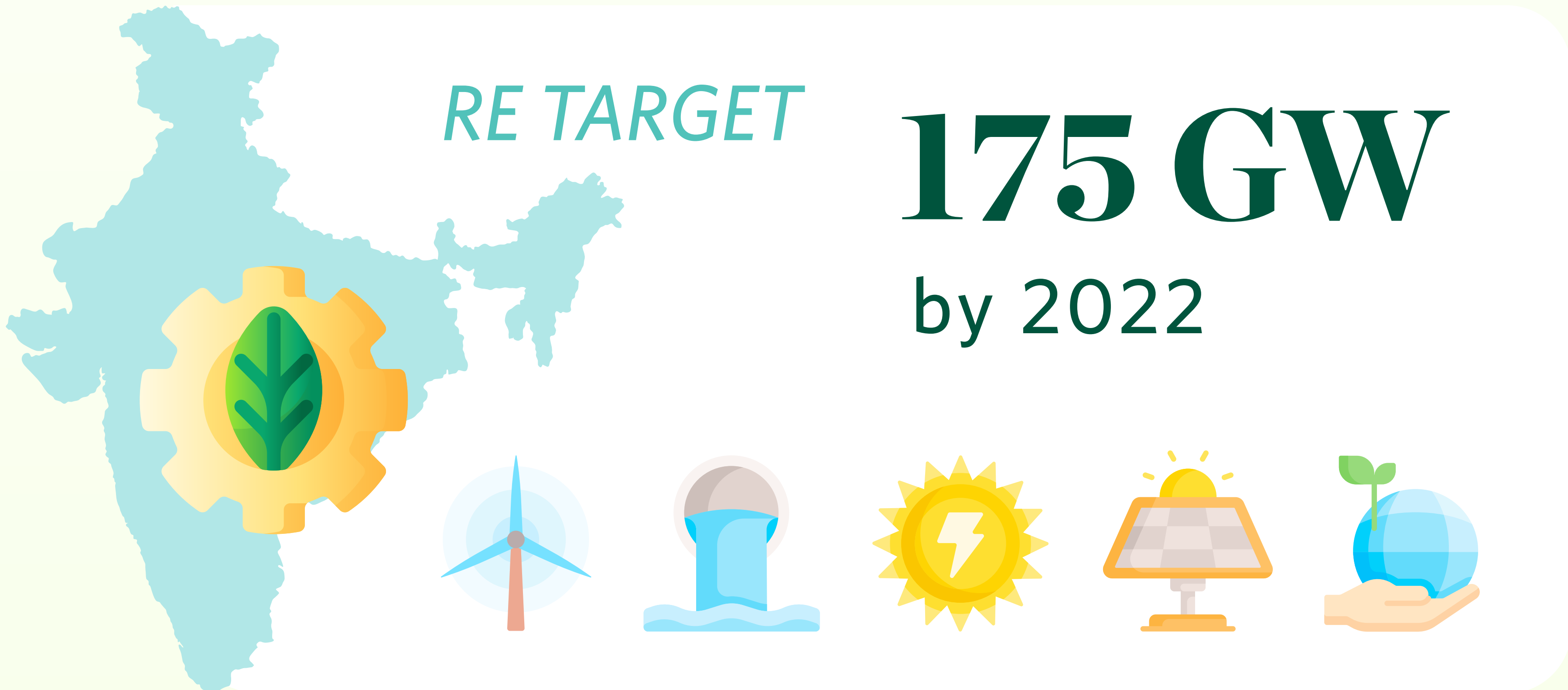
Rapid expansion of renewable energy (RE) is critical to meeting India's energy needs and addressing climate change. If new solar and on-shore wind energy projects – that will account for most of the future renewable energy capacity – are poorly sited, unintended impacts on ecosystems and local communities can hamper further growth of renewable energy in the country. Such buildout of renewable energy is likely to lead to socio-ecological conflicts and ultimately slow down the transition to a clean energy future. CEOs of renewable energy companies in India already rank land acquisition as the top challenge for the sector[1].

The good news is that if we take steps today to guide the expansion of renewable energy to lower impact areas , we have the potential to develop ten times India's 2022 target of 175 GW for renewable energy. Developing guidelines for project siting, identifying preferential areas for renewable energy, improving planning and procurement processes, and strengthening environmental and social performance standards of RE financing, are some such steps. These can help in more informed land use decisions, thereby accelerating deployment of renewable energy in India while ensuring minimal impacts to rural communities and the country's natural heritage.



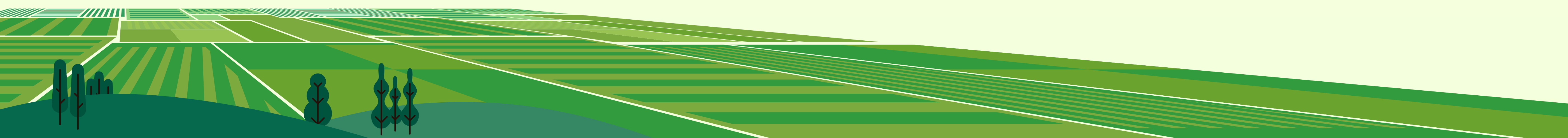
The Cost of Poor Siting

India ranks at the top of rapidly growing economies on clean energy investment, development and deployment2. Having committed to a renewable energy (RE) target of 175 GW of installed capacity by 2022, India has doubled its renewable energy capacity in the last four years to 89 GW. Demonstrating climate leadership, the Prime Minister of India has further shared his ambition to scale up this target to 500 GW by 2030. Driven initially by climate change concerns and cost-competitiveness, renewable energy expansion is getting additional impetus from urgent needs to enhance energy access and improve environmental conditions such as air quality.



However, the renewable energy buildout is projected to be a major driver of land use change in India, impacting an area approximately one and a half times the size of Sikkim by 2022[3]. Utility-scale on-shore wind and solar energy projects are expected to make up most of this target capacity[i], considering these projects require large land areas for development. If these projects are poorly sited, associated environmental and social concerns (See Box 1) can lead to conflicts. It is estimated that investments worth INR 13 lakh crore (USD175 billion) have been affected due to land conflicts arising out of social and ecological factors in India across infrastructure projects including but not limited to renewable energy[4].

Such conflicts are already emerging for the renewable energy sector (See Box 2) and will only increase – in both frequency and intensity – as siting options become more limited if adequate precautions are not taken. CEOs of renewable energy companies in India already rank land acquisition as the top challenge for the sector[1]. COVID-19, and the resulting reverse migration, can further exacerbate this risk of social conflicts as the returning workforce to rural areas implies increased dependence on land for subsistence and livelihoods. Such conflicts will increase investment risks for the renewable energy sector, and those financing it, due to potential project delays, higher costs and rising negative perceptions about the sector. Ultimately, this will slow the much-needed energy transition.

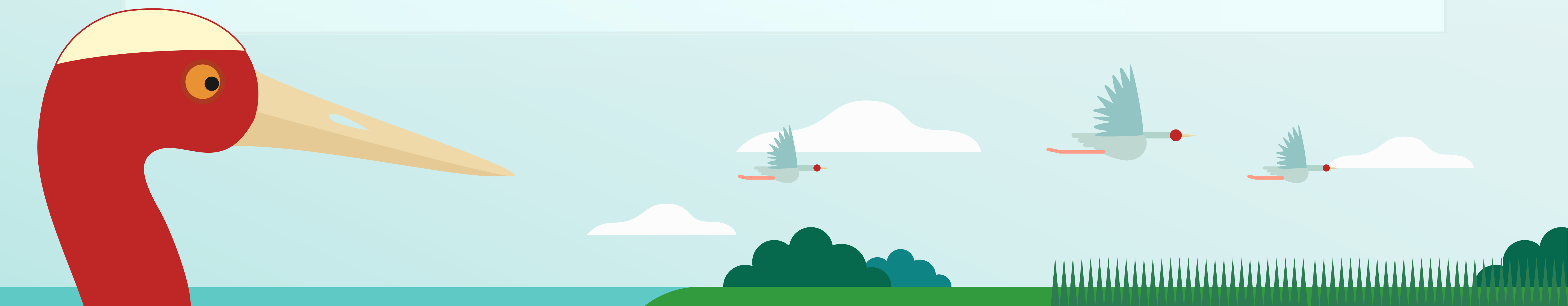


Box 1 Socio-ecological concerns from solar and wind projects

Environmental and social concerns vary depending on the specifics of a RE project and its potential impacts. While wind energy has large but diffused impact, solar energy has much smaller but more direct and absolute land use change. For wind energy, potential impacts include wildlife casualties from collision with wind turbines, degradation and fragmentation of habitats (as project sites are often fenced). Utility-scale solar projects can significantly impact forests or other natural habitats (such as grasslands) when these lands are cleared for development. Both types of generation also require supporting infrastructure, such as access roads and transmission lines, which further fragment landscapes. Community concerns range from socio-economic issues such as losing access to lands which they may be dependent upon (such as, for grazing their livestock) or may have high sociocultural values (such as, sacred groves) to potential visual impacts. Water demand for solar plants can also compete with needs of rural communities in water scarce regions.

Box 2 Evidence of conflict *(this is an indicative and not a comprehensive list)*

***Nallakonda Wind Farm Project**, Andhra Pradesh*	*Acquisition of community grazing land and clearing of forests led to erosion, landslides and silting of nearby waterbodies. Affected local communities have filed lawsuits and organized public campaigns in protest.*
***Wind projects by Greenko, Suzlon Energy** and others in Gujarat and Rajasthan*	*Transmission lines and wind turbines have been one of the major factors responsible for the recent deaths of Great Indian Bustards (GIB), a critically endangered bird. In response, MNRE has suggested retrofitting of transmission lines increasing project costs.*
***Charanka Solar Park**, Gujarat*	*Acquisition of lands used by local nomadic community (Maldharis) for cattle grazing without prior consultation. The associated loss of livelihoods has led to a lot of negative publicity for the project.*
***Oran Solar Energy Project**, Rajasthan*	*Oran in Jaisalmer is one of the largest and oldest Sacred Groves of India. It is also the wintering ground for GIB and the only local source of fodder. Locals, particularly pastoral groups, are fiercely opposing setting up of a solar plant and have submitted a plea to the Collector.*
***Koyna Wind Power Project**, Maharashtra*	*Expansion of windfarm in a wildlife sanctuary with several endangered species. Fines were imposed by the Central Empowered Committee (CEC) raising the overall project costs.*



A Win-Win Approach

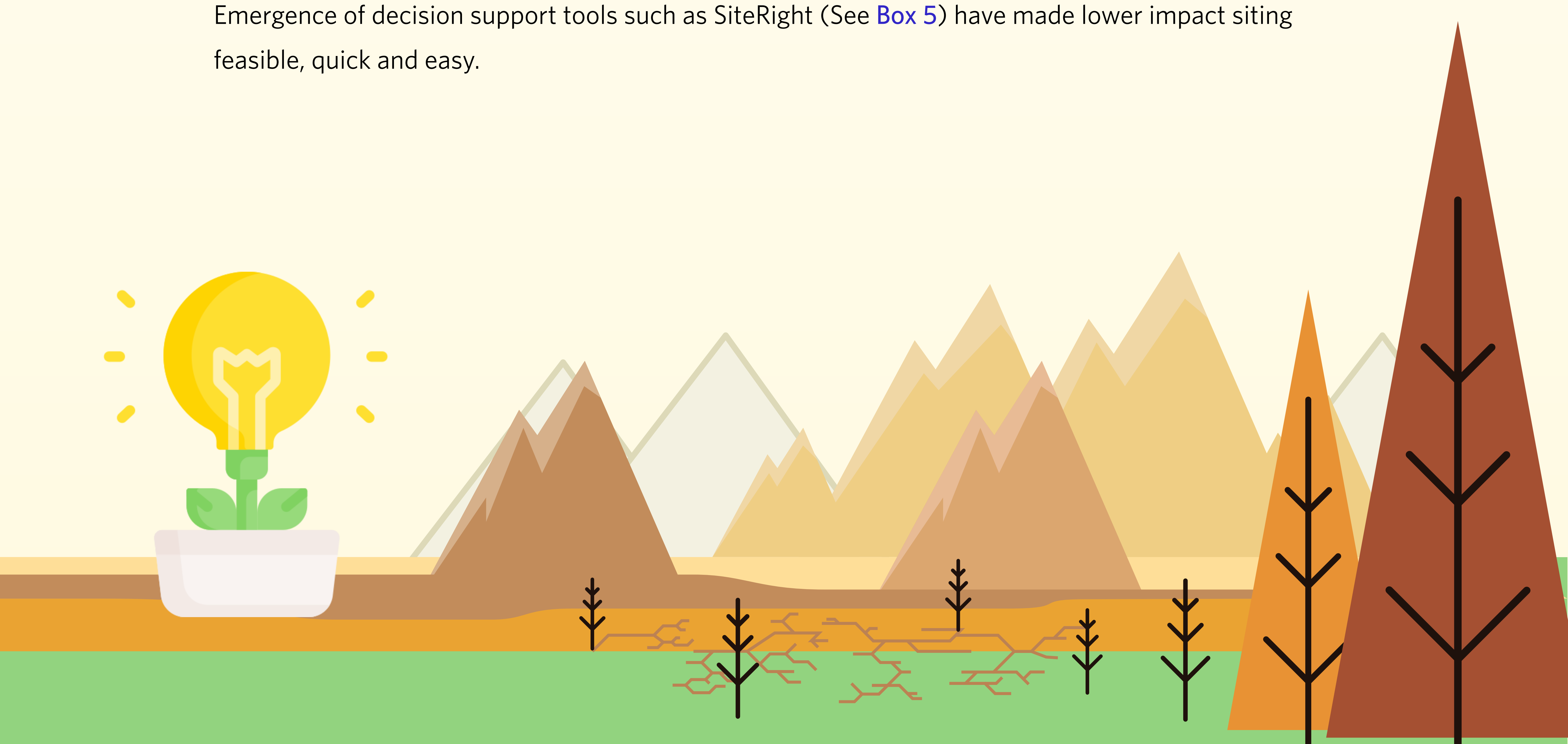
The good news is that if we take steps today to guide the expansion of renewable energy to areas with lower social and environmental impacts, we can develop more than enough renewable energy – in fact, we can achieve more than ten times our 2022 capacity goal[3] - while reducing the impact on vulnerable communities and our natural heritage. Lower impact siting (See Box 3) can help reduce barriers and delays, thereby expediting renewable energy development.

Box 3 *What do we mean by lower impact lower impact siting?*

Lower impact siting of RE means adhering to the following principles that help minimize social and environmental impacts:

- *Proactively* ***assess impacts from siting early in the planning process*** *before significant project investments have occurred.*
- *First* ***avoid*** *impacts to the extent possible and then minimize unavoidable impacts.*
- *Understand competing land use demands and account for* ***cumulative impacts*** *while making decisions.*
- *Ensure a* ***participatory process*** *that engages all stakeholders early and often, and transparently make project-related information available in public domain.*

The World Economic Forum has concluded that by putting nature-related risks at the core of processes and decision-making, businesses can avoid severe consequences on their financial performance[5]. This will also help ensure that policy goals, including Sustainable Development Goals, Nationally Determined Contributions to UNFCCC and Land Degradation Neutrality Goal, are advanced faster and at lower cost through improved coordination. In addition to reducing socio-ecological risks from conflicts for businesses, this inclusive approach will better respond to the local communities' needs. Such a proactive approach will benefit actors across the renewable energy sector (See Graphic 1). Emergence of decision support tools such as SiteRight (See Box 5) have made lower impact siting feasible, quick and easy.



Graphic 1 *Implications of poorly sited versus well-sited projects for Stakeholder Groups*

Costs of poorly sited projects	Benefits of well-sited projects

Policy makers

Costs of poorly sited projects

- *Ability to meet 2022 solar and wind targets compromised*
- *Other policy goals (tribal rights, double farmers' income, reforestation, land degradation neutrality) jeopardized*

Benefits of well-sited projects

- *Enable accomplishment of 2022 goals with reduced risks*
- *Expedited RE development by reducing socio-ecological risks from conflicts*
- *Reduced regulatory burden for project clearances and due diligence*
- *Achieve other policy goals, such as SDGs, NDC, and Land Degradation Neutrality, in tandem*

Businesses

Costs of poorly sited projects

- *May face difficulty in finding and acquiring land for projects*
- *Increased "soft" costs*
- *Impacted local relationships*
- *Longer project clearance time, uncertain and longer project timelines*
- *Negative media coverage and company image*

Benefits of well-sited projects

- *Reduced project clearance time, project costs and delays*
- *Reduced reputational risk*
- *Opens new avenues of financing such as Multilateral Development Banks*
- *Favorable perceptions with local communities*

Financial Institutions

Costs of poorly sited projects

- *Non-compliance with social and environmental safeguard policies increases risk exposure to investments*

Benefits of well-sited projects

- *Reduced cost of implementing and ensuring compliance to environmental and social safeguards*
- *Improved financial and operational performance*
- *Reduced unforeseen risks to investment*
- *Supports a social license to operate*

Local communities

Costs of poorly sited projects

- *Brought into the planning process late or not at all, resulting in impacts to land-based livelihoods*

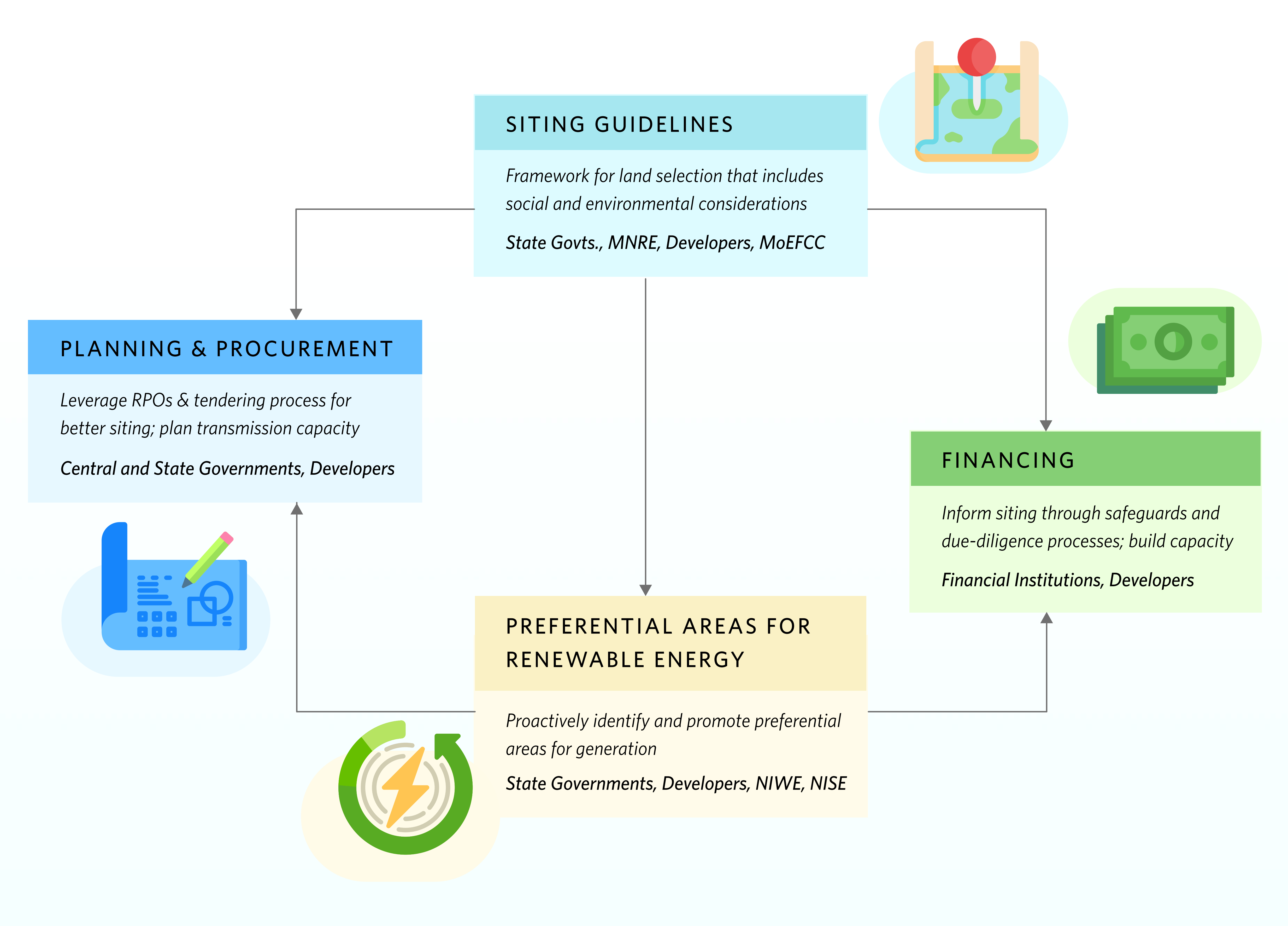
Benefits of well-sited projects

- *Better positioned to represent their interests*
- *Lower risk to lands relevant for meeting their socio-environmental-economic needs*

Pathways to Rapid Renewable Energy Deployment

Despite benefits of lower impact siting, several renewable energy projects in the past have been poorly sited resulting in conflicts. Absence of a consistent framework for siting and incentives to avoid conflicting areas have contributed greatly to this issue. In addition to promoting roof-top solar, guiding renewable energy development to lower impact areas will require India to adopt improved planning approaches and procurement practices that better acknowledge and reward lower impact project siting. The remainder of this document highlights four pathways for promoting the buildout of lower impact renewable energy in India. While there are synergies between different suggested pathways, these can be pursued in tandem or even separately by relevant stakeholders (See Graphic 2).

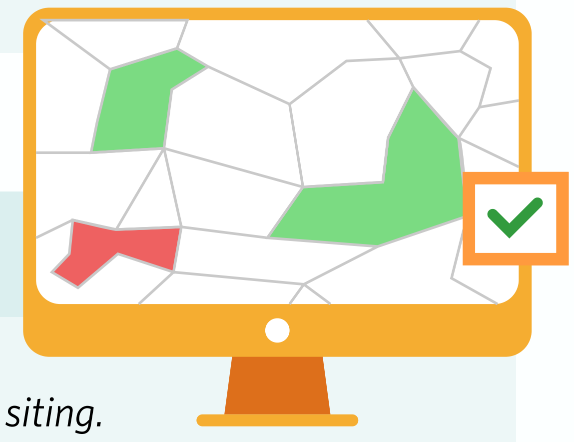
Graphic 2 *Pathways to Rapid Renewable Energy Deployment*



Fundamental to implementing these pathways is a set of socio-environmental criteria that will help steer renewable energy development to lower impact sites (see Box 4). Solar Energy Corporation of India has developed a management framework for assessing and minimizing environmental and social impacts from solar and wind projects which can be referred to identify potential criteria[6].

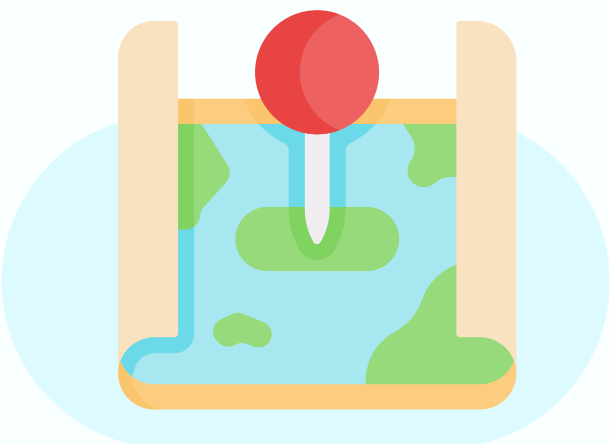
Box 4 *Potential criteria to identify lower impact sites for Renewable Energy*

- *Avoid or minimize use of common lands with high community dependence (including both, tangible and intangible)*
- *Avoid or minimize use of areas with high dependence from vulnerable community groups (such as Scheduled Tribes, Scheduled Castes, Landless, Nomadic Pastoral Groups)*
- *Avoid protected areas, wildlife corridors and flyways*
- *Avoid or minimize use of natural areas such as forests and grasslands*
- *Avoid or minimize use of biodiversity hotspots, Important Bird Areas (IBAs) and Key Biodiversity Areas (KBAs)*
- *Avoid or minimize use of habitats of Threatened and Endangered Species*
- *Avoid or minimize use of areas providing important ecosystem services (such as water recharge)*



Box 5 *Decision-support tools*

Decision-support tools can greatly assist in implementing recommended pathways to lower impact siting. An example of such a tool that is free and publicly accessible is SiteRight (www.tncindia.in/siteright).



1) Guidelines for Project Siting

Siting guidelines should be developed that provide a framework for land selection that is not only optimal from the perspective of renewable energy generation, but also limit ecological and social impacts. Ministry of New and Renewable Energy can develop such guidelines that include criteria to identify lower impact areas for site selection (See Box 4 for a list of proposed criteria). The guidelines should be developed in collaboration with state governments and relevant central ministries such as Ministry of Environment, Forest and Climate Change, Ministry of Panchayati Raj, Ministry of Rural Development, Ministry of Social Justice and Empowerment as well as the renewable energy industry. Such guidelines will facilitate quicker and better due diligence, reducing regulatory burden involved in project clearances and enabling financial institutions to reduce risk exposure to their investments.

Further, these guidelines should also encourage various ways to mitigate unavoidable socio-economic impacts wherever they are likely to arise. These could include measures such as a share of proceeds for impacted communities, promoting mixed land use projects, as well as remunerative compensations for lands that may need to be acquired for renewable energy projects.

To facilitate widespread adoption of siting guidelines, spatial information on environmental and social values will be required. This need can be addressed through the creation of decision-support tools that allow analysis of social and ecological data, and some of these tools are already available (See Box 5). For these tools to work effectively, best practices will need to be documented and training provided. Public reporting of individual projects can help in further enhancing the effectiveness of such guidelines.

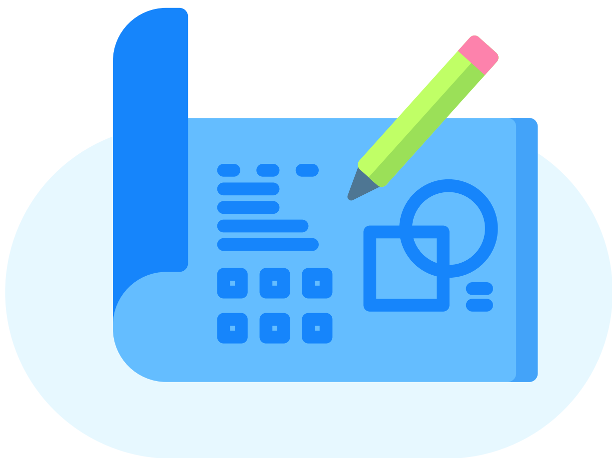
2) State Government identified Preferential Areas for Renewable Energy

State governments should consider identifying preferential areas for renewable energy, that are treated as priority areas for installation of generation and transmission capacity based on RE potential and environmental and social considerations. Significant planning and technical resources have already been developed by national agencies such as National Institute of Wind Energy and National Institute of Solar Energy on RE potential. Several tools such as Solar GIS, Global Solar Atlas, and Wind Atlas have also been developed. These can be combined with socio-environmental criteria (see Pathway 1) to help delineate such areas.

These preferential areas, which could be of varied sizes, should be designated by state governments and approved in advance of development for faster project deployment. This approach is well-suited for development on government lands, and such areas should be designated after consultation with local communities and environmental experts. Once preferential areas for renewable energy are identified, government should adopt policies that actively incentivize projects in these areas by making approval of such projects faster, cost-effective and of lower financial risk to developers. Incentives could include faster and easier project clearances, facilitating with needed transmission and financial benefits.

Contaminated and degraded lands, like retired minefields, old thermal power plants, closed landfills, former industrial sites, and renewable energy sites with less efficient technologies (such as old wind turbines) should be included in such preferential areas. Such places carry additional economic benefits such as existing transmission infrastructure and large stretches of available land that is potentially under single ownership.

Learnings from other countries where such approaches have been implemented highlight significantly reduced project approval time[iv], thereby helping expedite renewable energy deployment.



3) Improved Planning and Procurement Processes

Renewable Purchase Obligations (RPOs) that require state distribution utilities and large electricity consumers to purchase a certain percentage of electricity consumed from renewable energy sources has complemented the renewable energy goals in generating certainty of demand for renewable energy and spurring expansion. The same mechanism can be expanded to also contribute to better siting with priority being given to projects that are situated in preferential areas for renewable energy.

Procurement mechanisms such as RPOs can direct renewable energy development to lower impact areas by favoring procurement from eligible sites (such as preferential areas for renewable energy) during the tendering process. Alternatively, relevant central (Solar Energy Corporation of India Limited (SECI) and NTPC Limited) and state-level organizations can evaluate bids for proposed projects based on specific criteria (see Pathway 1).

In addition to procurement, electricity resource planning processes such as the Green Energy Corridor Project provide an opportunity to encourage or require consideration of environmental and social concerns while expanding the transmission network to meet the future energy demand.

4) Renewable Energy Finance

Financial institutions have a say on renewable energy siting through their environmental and social performance standards (also called safeguards) or through their due diligence process in the cases where performance standards have not been formally adopted. The International Finance Corporation and Equator Principle Banks have already adopted such performance standards that require “as a matter of priority, [that] the client should seek to avoid impacts on biodiversity and ecosystem services”[v]. Nationalized, private-sector, and multilateral banks, as well as, private equity investors that currently do not have such safeguards should seek information regarding environmental and social risks (based on criteria suggested in Pathway 1), as well as, mitigation plans of proposed projects. This information should be used for lending decisions. Likewise, these institutions often have ombudsman established to help resolve any potential conflicts arising from noncompliance. They may also have their own dedicated due diligence teams to verify such aspects. Further, financial institutions could provide concessional finance to projects located on preferential areas for renewable energy.

Financial institutions should also provide financial assistance to undertake technical studies for guiding lower impact buildout of renewable energy by supporting energy sector planning, pre-investment project portfolios, and socio-environmental and cumulative impact assessments.

Conclusion

Rapid expansion of renewable energy is critical to meet India's future energy needs and address climate change. If projects are poorly sited, this buildout of renewable energy is likely to lead to socio-ecological conflicts and ultimately slow down the transition to a clean energy future. If we take pro-active steps today to guide the expansion of renewable energy to areas with lower impacts, we can develop more than enough renewable energy to meet our renewable energy goals. This will not only benefit stakeholders across the renewable energy sector, but also ensure minimal impacts to biodiversity and rural communities. The central and state governments, businesses and financial institutions have important roles to play, as highlighted in the discussed pathways, if India is to accelerate deployment of lower impact renewable energy.

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End Note

i. The Parliamentary Standing Committee on Energy has said that the 40 GW rooftop solar goal (which is part of the overall goal of 175 GW by 2022) is unrealistic. Ground-mounted solar energy to compensate for the gap in achievement of the rooftop solar target will require more land.

ii. Achieving a clean energy future will require deployment of a range of solutions including reducing energy demand through energy conservation, energy efficiency, making grid upgrades, better battery storage systems and increasing distributed renewable energy generation. In addition to all this, we will also need to promote utility-scale solar and wind energy, which is the focus of this document.

iii. Soft costs include costs for getting necessary permits, clearances and approvals with regards to environmental and social impacts, project management, insurance, and legal fees, among others.

iv. The Solar Programmatic Environmental Impact Statement (SPEIS) identified REZs for 6 Southwestern states of the United States (USA). The project approval time as a result of a streamlined process was cut by more than half.

v. International Finance Corporation's Performance Standard 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources requires application of the mitigation hierarchy in financed projects. Accessible online at: https://www.ifc.org/wps/wcm/connect/3baf2a6a-2bc5-4174-96c5-eec8085c455f/PS6_English_2012.pdf?MOD=AJPERES&CVID=jxNbLC0.

The Nature Conservancy

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