

Creating local value: renewable energy auctions in Colombia

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A Wayuu fishermen settlement by the Jeparachi wind farm in La Guajira, Colombia
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Summary

This working paper examines how Colombia's renewable energy auctions can foster a just and inclusive energy transition by integrating socio-economic and community-driven objectives. The paper proposes two complementary pathways: (1) enhancing large-scale project benefit sharing and community engagement, through strengthened qualification requirements and multicriteria award mechanisms, and (2) scaling up energy communities by reserving auction quotas via an adhesion process and establishing a dedicated support agency. These pathways offer a unique chance to embed non-price indicators – such as socio-economic targets that ensure the renewable-energy rollout is more inclusive and equitable – and to implement tailored provisions that support the participation of energy communities within auction processes in Colombia.

1. Introduction

Renewable energy is at the heart of global climate action and a just energy transition. Renewables offer environmental, health and socio-economic benefits, including lower air pollution, job creation, improved energy access and greater energy security. However, they can also pose risks, such as threats to human rights and livelihood disruptions (Muñoz Cabré & Vega-Araújo, 2022). For countries to rapidly and successfully adopt renewable energy, they must address key risks such as regulatory uncertainty and financial challenges, while simultaneously maximizing citizen participation and economic, social and environmental benefits from renewable energy.

To encourage investment in renewables, many countries have implemented auction mechanisms, sometimes referred to as tenders or competitive procurement, as a highly cost-efficient market-based tool. Auctions are well regarded for their ability to drive down prices while encouraging investment by providing long-term revenue certainty (IEA, 2024; REN21, 2017). In the first half of 2024, 82 GW of renewable energy capacity was awarded globally in competitive auctions (IEA, 2024).

In many energy auction processes, the criteria for selecting winning bids are focused primarily on price and technical factors, such as the cost per kilowatt-hour and technical feasibility of the project. Auctions, however, may be designed to address a wider range of goals, including broader socio-economic development through the inclusion of non-price criteria (such as job creation or local procurement; see Annex for more examples). In the first half of 2024, 49 GW of capacity were contracted through auctions that included non-price criteria, corresponding to around 60% of all awarded capacity (IEA, 2024). The IEA has identified at least 15 countries that have used non-price criteria in their auctions, all in the G20 or EU.

In 2018, enabled by Decree 570, Colombia adopted renewable energy¹ auctions to help diversify its electricity mix and help achieve climate goals. In 2019, the first auction failed to award any contracts, while the second successfully allocated approximately 1.3 GW across three solar and six wind energy projects. The third auction, held in 2021, secured 796 MW from 11 solar energy projects (XM, 2021; see IRENA, 2021, for analysis of auctions in Colombia).

None of the auctions included socio-economic considerations, and many of the awarded projects face social acceptance challenges resulting in project delays and cancellations (Vega-Araújo et al., 2024). In Colombia, the lack of effective dialogue spaces, particularly for local communities, has led to an underrepresentation of their interests and needs, with government and corporate priorities prevailing (Jaramillo, 2023; Vega-Araújo et al., 2024). In response, communities and other social actors have turned to legal measures, including writs for constitutional protection (*tutelas*) and lawsuits, alongside direct actions like strikes, protests, and blockades (INDEPAZ, 2022a).

¹ Renewables other than large-scale hydropower are referred to in Colombia as non-conventional renewable energy sources (Ley 2099, 2021).

In September 2023, the Council of State annulled Decree 570 and related regulation under Resolutions No. 40791 and No. 40795 of 2018, removing the legal foundation for the country's renewable energy auction framework (Consejo de Estado, 2023). The government has identified the development of a new auction framework for renewable energy as a key strategy to advance Colombia's just energy transition (Ministerio de Minas y Energía, 2024).

In 2023, Colombia set a target for 20 000 energy communities (comunidades energéticas) across the country by 2026, as an approach to decentralize and democratize energy production and usage (Ley 2294, 2023). Energy communities are defined as forms of association among users or potential users of energy services aimed at generating, commercializing or efficiently using energy through renewable energy projects with up to 5 MW of installed capacity (Ministerio de Minas y Energía, n.d.; UPME Resolution 501, 2024).

The development of a new auction mechanism in Colombia presents a valuable opportunity to integrate non-price criteria such as socio-economic goals that help foster a more inclusive and equitable expansion of renewable energy, as well as ad hoc mechanisms to foster energy communities within the context of auctions. With this working paper, we hope to start a conversation and provide ideas on how Colombia's renewable energy auctions can be leveraged to prioritize meaningful community engagement, effective benefit sharing, and the inclusion of small and emerging stakeholders, such as energy communities. The findings are based on a literature review, expert interviews and a focus group held in 2024 with representatives from the Ministry of Mines and Energy. Additionally, the paper draws insights from previous workshops, interviews and fieldwork conducted as part of our earlier research; see, for instance, REN21 (2017) and Vega-Araújo et al. (2023, 2024).

2. Leveraging Colombia's renewable energy auctions to create local value

In Colombia, the potential of promoting broad socio-economic development through auctions has been largely unexploited (IRENA, 2021). Colombia's Just Energy Transition Roadmap emphasizes the need to incorporate social equity, employment, skills development and local economic enhancement into auction schemes (Ministerio de Minas y Energía, 2024).

In this section, we outline recommendations on how auctions can be leveraged to help address two key challenges in Colombia's renewable energy sector: first, scaling up energy communities and other community-driven projects and, second, ensuring meaningful community engagement and benefit sharing in large-scale renewable energy projects. These recommendations acknowledge that a critical barrier for energy communities is economic viability: high initial costs, limited access to capital, and difficulties securing financing (Ramírez-Tovar et al., 2023). Another barrier is process-related: timelines, scales and requirements designed to fit large developers that can rarely be met by communities (REN21, 2017). Furthermore, the success of

building large-scale renewable energy projects depends heavily on the quality of the relationships established between energy corporations and local actors, which can lead to a successful consultation and permitting (Universidad del Magdalena, 2023; Vega-Araújo et al., 2024).

2.1 Enhancing community engagement and benefit sharing from large-scale projects

Meaningful community engagement and benefit sharing are essential to ensure renewable energy projects foster local development, uphold human rights, and protect the environment. Meaningful community engagement involves building trust and continuous dialogue early on, establishing institutional structures, providing transparent information, maintaining effective and culturally appropriate communication, and setting up grievance mechanisms and binding agreements (JustRE Alliance, 2024; Minadakis & Vega-Araújo, 2024).

While there is no universal methodology for defining benefit sharing, it often refers to the contributions a project makes to the welfare of local communities. Benefit sharing from renewable energy projects can manifest in a range of forms, both monetary and non-monetary, including revenue sharing; project-ownership opportunities; building skills, knowledge and capacity; the provision of public services and infrastructure; and creating jobs. Benefit-sharing schemes are context-specific; while some countries have mandatory benchmarks, others rely on voluntary guidelines.

Over time, various categorizations for benefit sharing have emerged based on specific national and regional experiences (Lane & Hicks, 2019; Markkanen et al., 2024; Petrov & Tysiachniouk, 2019) or technologies (Arsenova & Wlokas, 2019; Hall et al., 2017; le Maitre, 2024). When designed in a culturally appropriate and conflict-sensitive manner, they can promote local socio-economic development and social cohesion while fostering positive relationships between the project and regional stakeholders; for examples of case studies and good practices, see JustRE Alliance (2024). Both mandatory and voluntary benefit sharing occur in Colombia (see Box 1).

In Colombia, the pursuit of low prices under price-based auctions has concentrated projects in resource-rich areas, often already impacted by other extractive industries, such as coal mining. This has contributed to heightening tensions between developers and local communities. For instance, La Guajira accounts for around 60% of the energy demand auctioned, and approximately 90% of the winning projects are located there. This concentration has sparked concerns over justice and equity, particularly regarding social and cultural impact management, benefit sharing, conflicts over land use and the legitimacy of consultation processes, leading to project delays and cancellations caused by various blockades and protests (Barney, 2023; Rangel et al., 2024; Vega-Araújo et al., 2024). The 2019 auction awarded renewable energy projects that had not completed prior consultation with affected communities by the time of the award, leading to rushed and disorganized consultations to complete all requirements to meet operational deadlines (INDEPAZ, 2022b).

BOX 1. BENEFIT SHARING IN COLOMBIA

Mandatory benefit sharing principally occurs through the electricity sector economic transfers (transferencias del sector eléctrico). These are economic transfers ranging from 1 to 6% of the electricity sales directed to local communities and municipalities where plants are located.^a National Law and regional level policy in some departments have indicated priority to locals in employment opportunities.^b However, no enforcement mechanism has been identified.

Voluntary benefit sharing frequently overlaps with Corporate Social Responsibility (CSR) initiatives, and it is often reached through company-community negotiations and agreements in the framework of local consultations or by Free, Prior and Informed Consent (FPIC). During FPIC processes, project impacts are discussed, and management measures are proposed and agreed on to prevent, correct, mitigate or compensate for these impacts.^c

In this context and in practice, there is often an overlap between benefit sharing and compensation, leading to ambiguity in distinguishing between the two. While benefit sharing can be mandatory or voluntary as mentioned above, compensations are legal obligations borne by companies for the impacts, damages or risks that are inherent in projects and, therefore, in no way can be presented as concessions, voluntary investments or modalities of philanthropy or voluntary corporate responsibility.

In the intersection between voluntary agreed benefit schemes and compensations in the framework of FPIC processes, there is often the allocation of a percentage of annual sales (in addition to electricity sector economic transfers), payments per megawatt or per wind turbine installed, or a percentage of carbon credits, among others. These tend to vary according to each project, per project stage, and they may even vary between communities affected by the same project (Barney, 2023; González Posso & Barney, 2019; Vega-Araújo et al., 2024). The lack of established guidelines, along with weak mediation, limited negotiation capacity among communities, inadequate follow-up mechanisms, and restricted access to project information, creates an uneven playing field in consultation processes.

^a Law 2294 of 2023. Decrees 1540, 1539 and 1538 of 2024 regulate the governance of the economic transfers allocated to Indigenous communities, to Black, Afro-Colombian, Raizal, and Palenquero communities, and to local municipalities, respectively.

^b Law 2099 of 2021 and Law 2294 of 2024 at the national level and, for instance, La Guajira's Departamental Assembly ordinance 575 of 2023 at the regional level.

^c In the absence of a statutory law, FPIC criteria and procedures have been outlined through executive orders, decrees, and Constitutional Court rulings [see, for instance, Rulings T-769 (2016), T-129 (2011), SU-123 (2018), T-462A (2014) and C-369 (2019), and Executive Orders No. 01 (2010), 10 (2013), and 08 (2020)].

The Colombian government should leverage the potential of auctions for promoting meaningful community engagement and benefit-sharing standards that are comprehensive, timely and fair, while building community support and positive outcomes. Concrete measures embedded in qualification requirements and awarding criteria are outlined below.

Qualification requirements

Including aspects related to community engagement and benefit sharing from the auction application stage helps increase community support, reduce delays in project approvals, and clarify mutual (community and project developer) expectations, while encouraging companies to consider social risks from the outset. Auctions' qualification requirements can include evidence across areas such as understanding local context, strategy for community engagement, a benefit-sharing program and other criteria, as follows.

A comprehensive understanding of the local context allows for accurately identifying and mapping project-affected communities; their values, resources, history and aspirations; and how they may be impacted. Also, this understanding helps ensure that consultations and benefit-sharing mechanisms reach the right stakeholders, including those with legitimate tenure rights.

Previous renewable energy auctions in Colombia required projects to be at Phase 2 or above, implying that projects have made progress in environmental assessments while also demonstrating economic and technical viability.² Auctions requirements can mandate bidders to go beyond the mandatory environmental impact assessments to include social impact assessments or ethnographic studies, including screening gender-related risks and the project's climate change impacts, the last of which will be required to be included in environmental impact assessments in Colombia beginning in August 2025 (Dejusticia, 2024).

A community engagement strategy must cover the whole project life cycle. The strategy should strengthen and align with local communities' governance mechanisms, such as autonomous protocols for FPIC³, and Indigenous communities' environmental planning instruments and measures⁴, while ensuring information about the project is easily accessible. Complementary requirements within engagement strategies can consider evidence of local support and feedback loops (e.g. through letters of support), public hearings and meeting records.

A benefit-sharing program should demonstrate transparency and accountability in the design, implementation and monitoring of benefit-sharing schemes. Also,

² The development of electric power plants in Colombia follows three distinct phases. Phase 1 (pre-feasibility) involves the initial analysis of the project, during which different location and technical alternatives are evaluated before securing grid access. Phase 2 (feasibility) encompasses projects that have demonstrated economic, technical, and environmental viability. Phase 3 (detailed engineering) includes projects in the final stages of design and implementation, with a focus on refining engineering details (UPME, 2018).

³ Autonomous consultation protocols are mechanisms developed by communities to define and regulate their customary norms and establish rules for interacting with external parties (Alvarado et al., 2020).

⁴ Decree 1275 of 2024 grants Indigenous authorities' jurisdiction over territorial environmental planning (MADS, 2024)

such programs should align with the local communities' Life Plans⁵ and could consider awareness raising around electricity sector transfers while advancing the establishment of Planning and Monitoring Committees to oversee the allocation and use of those funds (regulated by Decrees [1540](#) and [1539](#) of 2024).

A benefit-sharing program and community engagement strategy should include, at least, the desired outcomes, methods, projected timeframe, monitoring and evaluation methods, and conflict resolution measures. Establishing performance indicators can help define measurable standards and compare the performance of different projects and developers. Auction requirements should also encourage companies to incorporate a gender-responsive approach to community engagement and benefit sharing (Nelson & Kuriakose, 2017) and to include evidence on how bidders will engage with domestic suppliers along the value chain, among other considerations.

Recently, the first related auction in Colombia to introduce benefit-sharing-related requirements has been for offshore wind. Applicants must submit a Technical Skills Transfer Program establishing commitments for the transfer of technical capacities, knowledge and experiences; benefits for the communities; infrastructure enhancement; and bolstering existing capacities across various economic sectors, including the existing workforce in the country. The outcomes of the mechanism remain to be seen, as Maritime Occupancy Permits will be awarded between October 2024 and March 2026 for an 8-year term, followed by a 30-year Maritime Concession period in which the benefit-sharing program must be executed (Primera Ronda Colombia Eólica Costa Afuera, n.d.).

Verification mechanisms can prevent superficial compliance. These include introducing third-party verification or involving local agencies to monitor and ensure genuine engagement.

We recommend in particular announcing auctions well in advance and maintaining a regular schedule for auctions. Such clarity is essential for reducing uncertainty, enabling thorough preparation, and supporting competitive offers. In Colombia, renewable energy auctions have been stand-alone: each is organized individually with no commitment to future bidding rounds, creating uncertainty and limiting long-term planning for participants (IRENA, 2021). A systematic auction scheme in Colombia would allow bidders to plan more effectively.

Multicriteria award mechanism

Multicriteria auctions evaluate bidders based on a range of factors beyond price, such as specific community engagement and specific benefit-sharing considerations. This approach aims to select projects that align better with broader policy objectives while still factoring in price for winner selection. These criteria serve as preferences rather than strict requirements, with bidders who meet the desired qualities receiving bonuses to facilitate bid comparison (IRENA & CEM, 2015). Some examples of multicriteria auctions implemented globally are outlined in the Annex.

⁵ Life Plans are an autonomous planning tool for communities with collective property titles. These plans describe in detail the changes a community wants to achieve and its various land uses (DNP, 2019).

Compared to price-based awarding, multicriteria mechanisms are more complex to implement, involving challenges such as identifying the criteria; identifying the indicators to assess the criteria; establishing scoring rules for each indicator; and designating the relative weights of the different criteria (Factor, 2017; REN21, 2017). There is no single correct approach for awarding criteria, as it must be tailored to the national context, the specific goals of the auction, and coherence with other relevant policies beyond auctions (e.g. industrial policies) to enhance overall effectiveness.

Consultations and feedback loops with the industry and key stakeholders should be considered to ensure provisions are realistic and achievable. Measurable metrics for post-auction monitoring and evaluation should be clearly defined. This includes assigning responsibilities to monitoring authorities and establishing effective coordination mechanisms among the public procuring entity, awarded bidders and other relevant stakeholders to ensure transparency, accountability and alignment with auction objectives (World Bank, 2022).

We outline relevant criteria and indicators that could be included in multicriteria auctions based on the reviews we conducted in Table 1, which is not exhaustive (for more details and examples from different geographic settings, see the Annex).

Table 1. A set of relevant criteria and indicators for multicriteria auctions

Criteria	Indicator
Revenue sharing	Percentage of benefits into a community benefits fund (e.g. additional to electric sector transfers)
Shared ownership	Percentage of local co-ownership, which may include ownership stakes in the seller, construction contractor or operational contractor
Skills and employment	Disaggregated percentage of locals qualified, retrained, directly and indirectly employed (e.g. for coal miners and fossil-fuel fired power plants, women, ethnic groups, and youth); investment in public education and awareness raising campaigns; investment in institutional capacity building; percentage of local and female staff; share of trainees
Local procurement	Percentage of profits deployed in the local economy per project phase; percentage of revenue to build capacities of domestic suppliers; a joint venture with a domestic firm
Environmental stewardship	Enhancing local ecosystems and wildlife habitats (e.g. mitigating coastal erosion)
Community engagement	Bidder's track record of community engagement and coordination with relevant government authorities; regularity of the engagement; number of different players participating (diversity); robustness of the community engagement plan

There are additional opportunities for socio-economic benefits from auctions. For instance, renewable energy auctions could help alleviate high electricity tariffs, particularly on the Caribbean coast, by establishing preferential rates for communities near project sites through the government's "Tariff Justice" initiative (*Justicia tarifaria*). Additionally, auctions have the potential to support a just transition in coal-producing regions and areas with fossil-fuel power plants by channelling investment into emerging sectors, strengthening local supply chains, while prioritizing the retraining of coal industry workers.

2.2 Scaling up energy communities and other community-driven projects

Auctions can serve as a valuable tool to enhance the financial viability, or bankability, of projects by providing a clear and predictable revenue stream. This includes community-driven projects, such as energy communities, which tend to face severe constraints in getting access to auctions, due to process and project preparation costs (REN21, 2017). Auctions in Colombia have been price-based, an approach that tends to create disproportional challenges for smaller actors such as community-driven projects, as they struggle to compete with large utilities with stronger balance sheets, ready access to low-cost capital, and capacity to allocate the cost of project development to other projects in their portfolios.

Here we propose two measures to maximize the potential of auctions to support the development of energy communities: an adhesion process and establishment of an agency specifically meant to support communities.

Adhesion process

An adhesion process combines the efficiency of tenders with the effectiveness of feed-in-tariffs in supporting community-driven projects (REN21, 2017). Feed-in tariffs provide a stable and low-risk environment for community-driven renewable energy projects, offering guaranteed pricing and reducing investment security for stakeholders involved. This contrasts with tenders, where project submission timelines are fixed and usually short, prices are unknown, and there is no guarantee a project will receive a power purchase agreement.

The adhesion mechanism in auctions reconciles both approaches through the following considerations:

- Reserve a small portion of the auctioned demand (e.g. capacity or energy) for community-driven projects, such as a community quota. In addition to the main competitive bidding for large developers, this creates a set-aside allocation exclusively for community-driven projects, helping ensure these initiatives can participate without having to compete directly with larger, more established companies.
- Open access to the reserved untendered demand once the auction concludes, so that these projects can access it at the price determined by the result of the auction.
- Create a fixed time window (e.g. three years) during which communities could apply for a power purchase agreement at the price fixed by the auction on a first-come-first-served basis, until the reserved auction demand is allocated or the time window expires.

In pay-as-bid auctions, such as past auctions in Colombia, community-driven projects could be offered a price matching the last bid awarded. Although this approach doesn't provide additional compensation for community involvement, it could encourage

communities to operate as efficiently as possible and offer confidence in potential project revenue, helping secure funding or support from financiers and investors.

Support agency for community-driven projects

In Colombia, community-driven projects face barriers such as complicated regulatory processes and securing community trust and engagement, particularly in rural and Indigenous areas. Also, it is unlikely that people experiencing high levels of poverty and social exclusion can join forces and participate in energy communities without substantial external support that helps ensure a project's positive impact and long-term sustainability (Cárdenas-Álvarez et al., 2023). However, this external support may lead to “community washing”, where energy projects are labelled as community-based to increase appeal or meet legal benefits, yet they lack real community involvement, with decision-making fully controlled by external sponsors (Cárdenas-Álvarez et al., 2023).

A dedicated authority could be created or integrated within an existing institution to offer comprehensive support for community-driven projects, including capacity building and advisory services. Currently, the Colombian government has set up two bodies: the Energy Communities Focalization Committee (Comité de Focalización de Comunidades Energéticas) is in charge of determining whether applying energy communities meet required criteria, and the Administrative Committee for Energy Communities (Comité Administrador para Comunidades Energéticas), is responsible for defining the allocation of resources to finance the investment, operation and maintenance of energy communities according to a methodology established by regulation (Resolution 40137, 2024).

The proposed responsible authority would have a broader scope than the two committees. While Colombia's Energy Communities Focalization and Administrative committees focus mainly on verifying eligibility and allocating resources, the responsible authority would add extensive project-cycle support, such as mentoring, financial assistance and partnership facilitation. This would include promoting community engagement, monitoring genuine community benefits, and reducing risks of community washing. Essentially, it would provide hands-on, long-term support to foster community involvement, unlike the current committees, which mainly assess eligibility and manage funds.

Some of the proposed authority's responsibilities could include, among others (REN21, 2017):

- Granting a status to energy communities to establish the foundation for a project's eligibility to participate in specific policy mechanisms or support programs such as the accession process. This involves assessing whether a project meets predefined criteria, such as demonstrating genuine community ownership, governance and benefit-sharing structures.
- Monitoring the ongoing fulfilment of energy community features by projects that benefit from the accession process or other policy instruments, safeguarding against “community washing” by verifying that the project remains genuinely connected to the community throughout its lifecycle.

3. Conclusion

Renewable energy auctions present a significant opportunity to promote a just energy transition in Colombia by incorporating robust socio-economic and environmental considerations. While price-based auctions have achieved technical and economic feasibility, integrating additional requirements and awarding criteria around community engagement and benefit sharing helps maximize projects' socio-economic value, mitigate risks of delays, and foster social acceptance. These measures may raise upfront costs but yield long-term benefits, ensuring projects align with broader development goals and contribute meaningfully to Colombia's just energy transition.

However, if not carefully designed and implemented, incorporating additional elements into auctions, such as non-price criteria, can lead to unintended consequences. These may include making the process overly complex, reducing transparency, increasing the risk of legal challenges, and creating commitments that bidders may struggle to fulfil. Furthermore, the imposition of additional requirements on bidders can escalate costs and divert attention from the primary objective of ensuring the efficient deployment of renewable energy projects to meet ambitious targets.

Although we refer to renewable energy auctions, the insights in this document may also apply for other auction mechanisms non-specific to renewable energy but where renewable energy is eligible, such as those related to the reliability charge (see Villegas-Mendoza, 2023). We are hopeful that as Colombia continues its path towards increased renewable energy resources, it will leverage its auctions process to ensure that the country's energy transition is both just and equitable.

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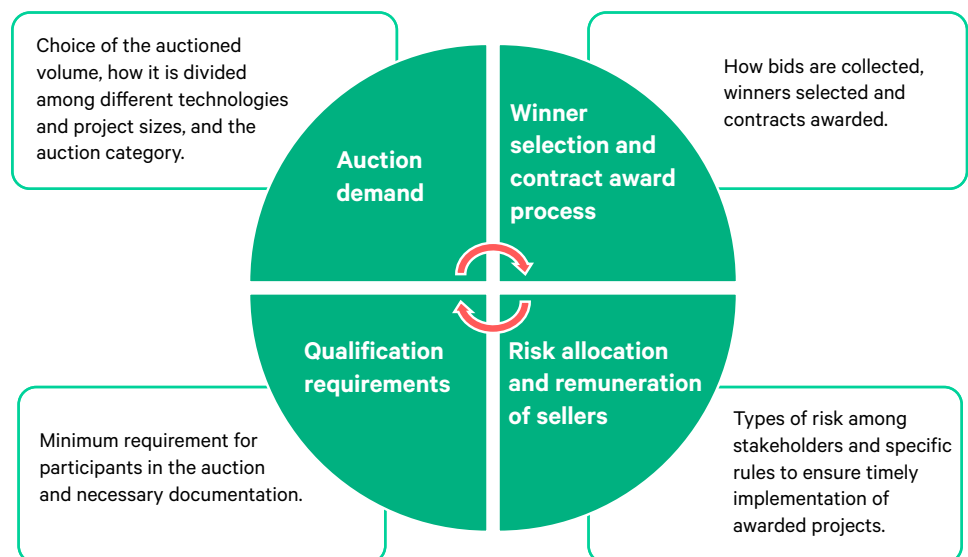
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Annex 1. A review of socio-economic development goals in auction design

To promote cost-effective deployment and wider socio-economic goals that contribute to a just energy transition, auctions can be customized to integrate various design elements. These elements fall into categories such as auction demand, qualification requirements and documentation, winner selection and the contract award process, and risk allocation and remuneration of sellers (Figure 1) (IRENA, 2019; IRENA & CEM, 2019). Evidence from various countries demonstrates that well-structured renewable energy auctions can potentially support local industry growth, generate employment, integrate small and emerging stakeholders, and promote subnational development opportunities (IEA, 2024; IRENA, 2019). Such normative experiences are explored below according to the framework categories from Figure 1.

Figure 1. Framework for auction design



Source: IRENA (2019)

1. Auction demand

This category defines what is to be procured and under which conditions. Key considerations include selecting the type of product (e.g. energy, capacity), determining if and how demand should be allocated among different categories (such as technology, location, generation profile), setting the auctioned volume and project size limits, establishing an auction schedule, and assigning responsibility for demand-side commitments, including the choice of the contract off-taker (IRENA, 2019).

Examples include:

- In Ireland, the first Renewable Electricity Support Scheme (RESS) auction included the use of a 30-GWh preference category for community projects, approximately 1% of the auction volume.
- In El Salvador, auctions have reserved a fraction of the tender for small projects.
- In India, a solar power auction reserved 50 MW of the total demand (300 MW) to relatively small-scale projects (1-4 MW) and only for newly established companies.
- In Japan, auctions have had a project size floor limit of 2 MW, reduced to 500 kW in 2019 and further reduced to 250 kW more recently.

2. Qualification requirements and documentation

This category determines the criteria with which suppliers must comply and the documentation they must provide to be able to participate in an auction. It typically includes evidence of the bidder's technical and financial capacity, project-related documents such as grid access or environmental and social impact assessments, and technical specifications of the project (IRENA & CEM, 2015). It also includes commitments to local socio-economic development, recognizing the benefits that a domestic renewable energy sector can offer and encouraging bidders to support regional growth and align projects with community needs and interests. This is explored further through specific examples below in different aspects such as community engagement; local benefits, value chains and the environment; shared ownership; and employment and training.

2.1 Community engagement

In the State of Victoria, Australia, auction applicants are requested to demonstrate the extent of community engagement and benefit sharing of their projects, including evidence of social risks analysis; community engagement strategies; benefit-sharing programs; reporting, monitoring and evaluation plans; and letters of support to the project.

In Ontario (Canada), renewable energy projects under the Large Renewable Procurement program were requested to meet mandatory community engagement requirements, including submitting a Community Engagement Plan and Site Considerations Information. Additionally, developers were requested to make their best efforts to arrange at least one meeting with municipal officials, and at least one public meeting must be held for each proposed project in each of the local communities.

In Quebec (Canada), the bidder must demonstrate that a wind energy project has the support of the local community administering the territory where the wind farm will be located. For wind energy projects on public lands (state-owned, regional, federal or Indigenous lands), the bidder must provide formal documentation, such as a resolution or letter of intent, signed by an authorized representative of the relevant public authority, covering all required land.

In Norway, qualification criteria for offshore wind auctions include a plan that contains measures to facilitate good co-use and coexistence within the project area and with the affected stakeholders, including fisheries and maritime traffic.

2.2 Local benefits, value chains and the environment

In Ireland, for the first offshore wind RESS auction, successful bidders must contribute EUR 2/MWh of electricity generated to a local Community Benefit Fund. The RESS 4 auction (2024) for onshore projects also includes this requirement.

In Quebec (Canada), wind energy auctions require the bidder to commit to an annual payment of CAD 6227/MW installed to local communities. This amount excludes any potential equity benefits.

In Lithuania, awarded offshore wind energy projects must support the local community with EUR 1/MWh and a specific share of investment and operation expenses need to be spent on small- or medium-sized enterprises.

In Uruguay, wind power tenders' requirements included having at least 20% local content, and that the control centre be based in Uruguay.

In El Salvador, the 2014 tender for 100 MW of solar and wind power required that developers invest 3% of the annual income in social projects proposed and prioritized by local communities and approved by the municipality's mayor's office where the project will be developed.

In China, onshore wind auctions started requiring a minimum of 50% local content in 2003, later increased to 70% in 2005, playing a significant role in the development of the domestic wind industry. This requirement was abolished in 2009.

In India's solar photovoltaic (PV) auctions, installed modules must be procured from manufacturers on the Approved List of Models and Manufacturers (currently only companies manufacturing in India).

In Spain, "Just Transition Nodes" reward grid access to bidders that submit evidence on how renewable energy projects contribute to a just transition in regions affected by the downscaling of thermal power generation. Aspects considered include local job creation that recruits women; training and retraining of locals; investment into local value chains; and environmental impact assessments.

In Norway, minimum requirements for offshore wind auctions include measures to minimize climate footprint, manage waste and reduce environmental impacts.

2.3 Shared ownership

In Namibia, NamPower, the national utility, included "previously disadvantaged Namibians" in auctions. The Equitable Economic Empowerment Policy included as a condition for obtaining a generation licence 30% ownership and shareholding by the "disadvantaged", with special emphasis on women and disabled individuals.

South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) mandated a minimum threshold of 2.5% shareholding in bid windows 1 to 4, for communities within varying proximity of these power projects.

2.4 Employment and training

In Turkey's 2017 wind auction, it was mandated that bidders guarantee that 80% of the engineers hired for the project would be Turkish nationals.

In Denmark's auction for the Horns Rev 3 offshore wind farm, a social clause on apprenticeships required the involvement of a specific number of trainees during the construction phase of the project.

In Colombia, applicants to the first offshore wind auction must submit a Technical Skill Transfer Program establishing commitments for the transfer of technical capacities, knowledge and experiences; benefits for the communities; infrastructure enhancement; and bolstering existing capacities across various economic sectors, including the existing workforce in the country.

In Uruguay, wind power tenders' requirements included that maintenance after the first year be done 80% by local employees.

In Ecuador, 100% of non-qualified labour and at least 50% of technical staff must be Ecuadorian nationals. In addition, generators are required to provide continuous training for Ecuadorian personnel through specific courses, internships and other programs that ensure ongoing, specialized learning aligned with the generation technology used.

In Germany, projects' description must contain the ratio of trainees to employees subject to social security contributions at the time of bidding.

3. Winner selection and contract award process

The winner selection process involves applying bidding and clearing rules to award contracts. Key aspects include: (a) formal bidding procedures that outline how supply-side information is gathered; (b) minimum competition requirements to ensure the participation of multiple competing bidders; (c) winner-selection criteria that rewards higher performance in specific project characteristics; and (d) a clearing mechanism, which sets the rules for allocating contracts based on accepted bids (IRENA & CEM, 2015).

In Malaysia, winner selection has relied on a multicriteria score that considers four different elements: the project's connection site, voltage and size; land usage; local content; and social benefits. Merit score for local content depends on 100% locally manufactured and assembled PV modules or inverters; it also grades social benefits, such as provision of community services or public amenities offered, for example construction of a place of worship, establishment of a non-profit welfare service, supporting or establishing an education institution, or building a stadium. Additionally, the land designated for the power plant can be optimized for other economic activities,

such as agriculture, rather than being limited solely to solar energy generation, potentially earning additional merit points.

In South Africa, the REIPPPP allocated 90% of the total evaluation score to bid prices. The remaining 10% was based on a combined assessment of economic development factors, including job creation, local content, ownership, management control, preferential procurement, enterprise development and socio-economic development.

In Colombia, the evaluation criteria of the first offshore wind auction includes a requirement to demonstrate experience in executing Technical Capacity Transfer Programs accounting for not less than USD 100 000. This criterion is weighed at 5% in the evaluation of the proposal.

In Belize, the 2013 auction, bid ranking was based on a points system: 20% for managerial, financial and technical competence, 60% for pricing, and 20% for socio-economic and environmental impact.

In Uganda, a multicriteria auction was implemented in which environmental and social compliance account for 30% of the evaluation weight.

In Japan, the award criteria for the offshore wind energy auction held in 2021 was based in a maximum of 240 points divided evenly between the supply price and factors related to business feasibility. The latter includes demonstration of the bidder's capacity to coordinate with local actors and promote spin-off effects at the regional and national levels (e.g. employment, investment and construction of production facilities and methods for ensuring dialogue between local fisheries and shipping companies).

Germany's solar PV auction incentivized ground-mounted projects to be developed in industrial zones rather than on land suitable for agriculture. This approach involved capping the number of projects allowed on arable land; once this limit was reached, support for ground-mounted systems was restricted to brownfield sites, areas along train tracks and highways, or other non-arable locations.

The EU Net-Zero Industry Act includes mandatory non-price criteria in procurement procedures for clean technologies and renewable energy auctions. Public authorities must evaluate the auction's contribution to sustainability and resilience, cybersecurity, responsible business conduct, and ability to complete projects on time.

In France's solar PV auctions, bidders can earn up to 100 points: 70 for bid price, 16 for the carbon footprint of PV modules, 9 for environmental relevance (e.g. using degraded land), and 2 to 5 for citizen participation (e.g. collective financing or shared governance). Award criteria for offshore wind are distributed as follows: price (70%), robustness of contractual arrangement and financing (5%), environmental impact (15%), and social and local impact (10%).

Korea's wind energy auctions have an award criteria based on price (60%), local community acceptance (8%), contribution to industry and economy (16%), domestic track record (4%), project progress (4%) and system acceptability (8%). Also, solar PV auctions are multicriteria: price (70%), carbon footprint (15%), project development

progress (3%), financing structure (3%), insurance (3%), whether a project is owned by farmers, livestock farmers, fishers, etc. (3%), and project operation period (3%).

In Quebec (Canada), a multicriteria score system awards bids based on price (60%), sustainable development (18%), local content (12%), experience (2%), financial capability (2%) and project feasibility (6%).

In Germany, the award criteria for offshore wind is distributed as follows: price (60%), proportion of electricity from renewable sources used in the manufacturing of wind turbines (10%), scope of long-term electricity supplies to third parties (10%), use of particularly environmentally friendly tower-foundation methods (10%) and share of trainees (10%).

In Spain, socio-economic impacts weight 64% in auction award criteria, distributed among total jobs, jobs for coal workers, jobs for women, reskilling, distributed energy, local investments and local participants.

4. Risk allocation and remuneration of sellers

The category of risk allocation and seller remuneration refers to how various risks – such as financial and operational risks – are distributed among stakeholders, including bidders, auctioneers, offtakers, financial institutions and consumers. A key aspect to consider is actor diversity and the inclusion of new and small actors that are relatively more exposed to allocation risk, since large bidders are usually more financially robust (Côté et al., 2022). Remuneration from the auction should represent sufficient compensation for developers and investors to assume project risks.

For auctions in the US, the bid made by a particular bidder in each round will represent the sum of the monetary factor (cash bid) and the value of any non-monetary factors in the form of “bidding credits”. Auctions offer the opportunity to earn bidding credits worth a percentage of the bid in exchange for commitments to support local workforce training programs; strengthen a supply chain for offshore wind manufacturing, assembly, or services; or reduce impacts on fisheries through a Fisheries Compensatory Mitigation Fund. The provisional winner of each lease area will pay the final posted price (less any applicable bidding credit) or risk forfeiting its bid deposit.

In France, projects that reach a specific level of local financial participation receive a community participation bonus in addition to the auction price. For citizen participation through capital shares in the project company, an additional bonus of EUR 0.3 cents/kWh is added to the feed-in premium determined by the auction. For citizen participation through project financing, the bonus is EUR 0.1 cents/kWh, reflecting the reduced level of involvement in project governance compared to capital participation, which may include dedicated voting rights.

In Germany, three measures were introduced in 2017 for community energy projects: lower prequalification measures in the form of not needing a building permit and receiving a reduced bid bond; extended timeframes to complete their projects; and receiving the price of the highest successful bid.

In Brazil, Italy and Mexico, agents are allowed to sell their electricity (and other energy products) in the wholesale market until the scheduled commercial operation date.

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