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HOW MULTILATERAL DEVELOPMENT BANKS (MDBs) CAN BOOST SMALL-SCALE ENERGY SOLUTIONS

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Summary

Small-scale clean energy solutions have strong potential to deliver people-centred benefits rapidly. These solutions are non-fossil fuels based, decentralised, and below transmission levels – such as distributed renewables, energy efficiency and storage. They make energy more affordable and secure socio-economic development benefits faster than large-scale infrastructure. Such benefits include increased energy access, employment and improved resilience to energy price volatility.

Despite this, global investment in small-scale energy solutions is nowhere near what is needed. This is especially true in emerging and developing economies (EMDE) where perceptions of risk in the small-scale energy sector often prevent investment.

MDBs can be influential in establishing norms and opening new markets. This role could help to bridge the gap, yet only less than one-tenth of MDB energy finance is currently directed to small-scale energy. MDBs should make structural adjustments to shift finance towards small-scale solutions. At the same time, the shareholder governments must be aware of the potential of small-scale solutions and seek opportunities to implement these recommendations in MDBs. This briefing paper sets out seven recommendations for MDBs and shareholder governments to quickly increase this finance and create substantial and widespread development and resilience benefits.



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Recommendations for MDBs and shareholders

1. **Set out a common pact for unlocking the massive development benefits from small-scale energy solutions.** This should prioritise emerging and developing economies (EMDE) that urgently need access to finance and de-risking mechanisms in the current crisis context.
2. **Shareholder governments must play a more effective and vigorous role in realising small-scale energy solutions benefits.** Governments should integrate them into national energy transition and development plans.
3. **Fill data gaps by establishing a common database to increase transparency and accountability.** Such a database should ease the tracking of project efficiency and impact, and ensures that further grants demonstrate clear additionality. Harmonisation should occur across the MDBs, and other development finance institutions (DFIs), in project development.
4. **Set clean energy financing targets that align investments with net zero scenarios.** Across public and private finance, \$4.5 trillion annual spending by 2030 is needed to finance the global energy transition – triple the current global investment.¹
5. **Target a percentage of energy-related funding to small-scale energy solutions, through forthcoming policy reviews.** MDBs should also support the development of specific financing facilities for this sector, and provide technical assistance. With four major MDBs conducting their energy policy review this year, the time is now to establish the required architecture.
6. **Adjust incentive structures in the MDB project development process to allow small-scale energy projects to gain priority over larger fossil fuel projects.** This includes fair assessment of small-scale energy's higher impact, and reviewing organisational incentives that penalise spending on small-scale projects.
7. **Further strengthen partnerships with financial intermediaries, including enhancing transparency and standardisation.** Channelling funds via intermediaries helps address the costly preparation and administration of small-scale projects at the MDB-level. MDBs should support intermediaries in scaling up investment in small-scale energy and enhancing the availability of investment data. They should also support the adoption of relevant standards, and integrate them into the procurement processes.

¹ IEA, 2021, [Net Zero by 2050: A Roadmap for the Global Energy Sector](#)



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The opportunity: small-scale energy solutions bring significant resilience and development benefits in a broad economic scheme

In this study, we refer to **small-scale energy solutions** as those that are non-fossils, decentralised, deployed below transmission scale, and tend to be close to communities and peoples' lives. Examples include distributed solar, energy efficiency, storage, and demand-side response. They provide the fastest, cheapest solution to tackle climate, energy, and development issues – while supporting a people-centred energy transition.

Russia's invasion of Ukraine and the resulting energy crisis have varying implications across the globe. Low- and middle-income countries (LMIC) now face disproportionate impacts with high risks of debt distress, food shortages, and soaring fuel and commodity import costs.² **The global efforts to transition away from fossil fuels must take into account resilience and development perspectives that are especially relevant to low- and middle-income countries.**

The current wave of enthusiasm to re-embrace fossil fuels risks leaving countries in a more vulnerable position with unmanageable stranded assets. Demand for fossil fuels is set to plummet as investments in large-scale renewables materialise, leading to job uncertainty. Fossil fuel exporting countries are at risk of net job losses with a projected 75% reduction in employment by 2050 in a well-below 2 °C scenario.³ Additionally, fossil fuel exploration, notably in Africa, has failed to bring development and resilience benefits. Fossil fuel exporters in Africa suffer three times slower rates of economic growth than other countries, as well as increasingly unsustainable levels of debt.⁴

Meanwhile, small-scale energy solutions quickly improve energy affordability by reducing consumer bills, reducing dependence on diesel generators, and improving resilience to volatile fuel prices. These solutions can therefore address the energy, development, and climate nexus quickly, without waiting for massive, large-scale infrastructure that will take years to materialise.

² ODI, 2022, [Economic vulnerability to the Russia–Ukraine war](#)

³ Pai et al., 2021, [Meeting well-below 2C target would increase energy sector jobs globally](#)

⁴ Bassey & Lemos, 2022, [Africa's Fossil-Fuel Trap](#)



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Distributed or off-grid solutions such as mini-grids and solar home systems have already improved energy access for over 100 million people. They have provided an estimated \$12.9 billion in savings on energy expenditure, and generated \$7 billion in additional income to customers since 2010.⁵ In Africa, mini-grids have shown resilience by gaining almost double the number of connections during the pandemic.⁶ They continue to outperform national utilities in terms of the number of reliable connections and downstream job generation.⁷ Scaling access to distributed renewables also holds the potential to create over 25 million new jobs in Asia and Africa – 30 times higher than through comparable investments in large-scale fossil fuels.⁸ Deploying small-scale solutions enables faster access to electricity, compared to waiting for grid expansion that can take years or even decades. Moreover, increasing energy access via off-grid solutions can cut costs by up to 30% compared to grid expansions, especially in rural areas.⁹ Replacing diesel generators with distributed solar can provide up to 65% savings over the project lifetime¹⁰ and mitigate the risks of acute respiratory illness that is most damaging to children and the elderly.¹¹

As renewables enter the power system and energy demand is rising, **demand-side response measures¹² are the cheapest way to balance the network and minimise path dependencies in the power system.** Demand-side response helps mitigate over- or under-supply and improves the performance of an unreliable grid. This problem is still common in many developing countries and causes four in ten Africans¹³ to face regular blackouts. Addressing this with smart demand-side responses can reduce costs for households and businesses. Investment savings up to \$270 billion can be channelled towards the new electricity infrastructure needed to meet demand growth.¹⁴

⁵ GOGLA, 2021, **Global Off-Grid Solar Market Report Semi-Annual Sales and Impact Data**

⁶ AMDA, 2022, **Benchmarking Africa's Minigrids Report**

⁷ *ibid*

⁸ The Rockefeller Foundation, 2021, **Transforming a Billion Lives: The Job Creation Potential from a Green Power Transition in the Energy Poor World**

⁹ Deutsche Gesellschaft für Internationale Zusammenarbeit, 2019, **Off-Grid Renewable Energy for Climate Action – Pathways for change**

¹⁰ Babajide & Brito, 2021, **Solar PV systems to eliminate or reduce the use of diesel generators at no additional cost: A case study of Lagos, Nigeria**

¹¹ United States Environmental Protection Agency, 2022, **Impacts of Diesel Exhaust and the Diesel Emissions Reduction Act (DERA)**

¹² Such as digital solutions, and market design that provides economic incentives to customers in the form of savings.

¹³ AfroBarometer, 2016, **Off-grid or 'off-on': Lack of access, unreliable electricity supply still plague majority of Africans**

¹⁴ IEA, 2021, **Promoting digital demand-driven electricity networks**



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Meanwhile, **investments in energy efficiency will rapidly reduce energy costs, increase national energy security, and enable increased energy access.** Energy efficiency has saved \$5.7 trillion in energy costs globally between 1990 and 2015.¹⁵ Governments can even achieve increased income and public budget benefits through job creation. Increased security can be achieved with the avoided fossil fuel imports; as much as 20% of imports were avoided in 2017.¹⁶

Pairing super-efficient appliances with off-grid energy systems makes it possible to supply remote areas. Efficient appliances can also help reduce pressure on the existing grid and improve reliability.¹⁷ Finally, small-scale energy solutions provide an opportunity to link energy, climate, development and community livelihoods by encouraging productive uses¹⁸ that provide opportunities for new business activities or increased productivity, generating more income for the community. Such an increase in productive uses can serve as anchor loads that further reduce the overall cost of electricity by at least 25%¹⁹ and minimise low-capacity utilisation and/or financing risk for distributed energy systems where residential electricity use is low.

Case study: Wuse Market in Nigeria is set to be the first diesel generator-free market in the country. With partnerships under the Nigeria Electrification Project (a Nigerian government initiative jointly funded by the World Bank and the African Development Bank), the Wuse Market Association, Green Village Electricity company, and the Abuja Electricity Distribution Company (AEDC) introduced an interconnected mini-grid project that aims to provide uninterrupted power supply to over 2,000 market customers. This initiative helps small- and medium-sized businesses to switch from their individual diesel gensets to solar-hybrid mini-grid generation, while at the same time helping to reduce AEDC's losses in clustered underserved areas such as plazas, markets, and estates. This is a good example of how small-scale energy can deliver access, climate, and development benefits to the community, despite slow progress in terms of large-scale, grid infrastructure. It shows how MDB funding can support small-scale energy solutions.

More info: [REA Partnership with AEDC & Wuse Market](#)

¹⁵ IEA, 2015, [Energy Efficiency Market Report 2015](#)

¹⁶ IEA, 2019, [Multiple Benefits of Energy Efficiency](#)

¹⁷ *ibid*

¹⁸ Etcheverry, 2003, [Renewable Energy for Productive Uses: Strategies to Enhance Environmental Protection and the Quality of Rural Life](#)

¹⁹ ESMAP, 2019, [Mini Grids for Half A Billion People: Market Outlook and Handbook for Decision Makers](#)



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The gap: investment in small-scale energy solutions

Do we need the MDBs?

Despite the development benefits described above, financing small-scale energy solutions can be challenging. **Finance actors are currently missing the development opportunity to invest. Small-scale energy investments, particularly in EMDE, are still regarded as a high-risk segment by many international financiers, preventing capital flows into the industry.** For example, these risks may include the uncertain regulatory environment, lack of bankability, low ability of customers to pay, and currency risks. This is also hampered by the lack of capacity or understanding from the local financial institutions. These perceived risks increase the cost of accessing finance, and make it less affordable and less attractive for financiers. MDBs' expertise and influence in bringing systemic change and opening new markets are needed to bridge this gap.

MDBs have a pivotal role in scaling up these small solutions. They have the unique ability to bring in innovative financing structures, mitigate risks, help the government to drive policy and institutional change, and bring in knowledge and innovation needed in the market. Therefore, **MDBs are distinctively placed to leverage private finance at multiples of what is available through public finance and help build more bankable projects in EMDE.**

From, 2017 to 2021, MDBs contributed at least 81% of the public finance which was invested in small-scale energy solutions (see Figure 1). Yet, the value is only a fraction of what MDBs have in their financing pot and what the world needed in terms of annual investment. **Distributed renewables and energy storage only account for 0.5% and 1% of total MDB energy-related finance respectively.**²⁰ Large-scale infrastructure projects still account for more than 90% of all MDB energy spending, with more than 15% of these investments still going to fossil fuel projects.²¹

²⁰ E3G analysis based on Oil Change International, 2022, [Public Finance for Energy Database](#)

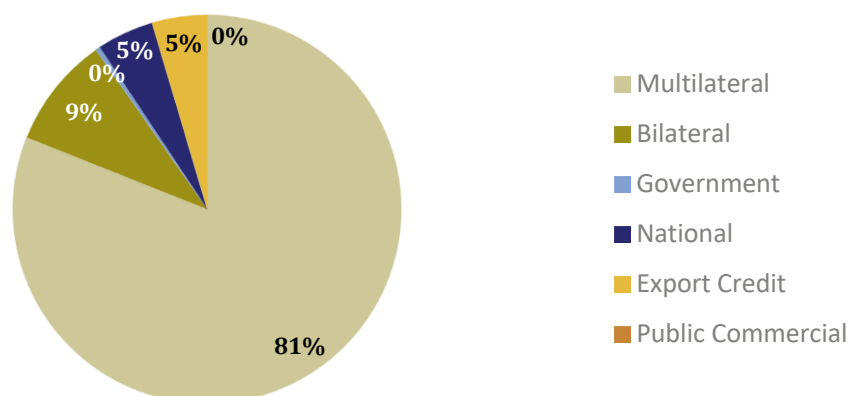
²¹ *ibid*



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Figure 1: Sources of small-scale public investment by type of institution, 2017–2021. MDBs dominate public investment in small-scale energy solutions, but the amount is not yet enough.

Small-scale public finance by source (2017–2021)



Source: E3G analysis based on Oil Change International, 2022, [Public Finance for Energy Database](#)

How much investment do we need?

Meanwhile, **investments in small-scale clean energy solutions need to ramp up fast within this decade if we are to reach net zero by 2050, in terms of both the overall amount of investment and geographical distribution.** For example, average annual investments in flexibility measures such as battery storage systems and demand response would need to multiply 21.6 times.²² Energy efficiency calls for a \$900 billion annual investment by 2030.²³

MDBs and other international financial institution (IFI)’s investments currently only provide 1% of the world’s energy efficiency investment needs, at an average of \$8 billion per year from 2015 to 2019.²⁴ Geographically, these small amounts of public finance for energy efficiency are still largely concentrated in high-income economies. For instance, investments in smart meters across EMDE totalled less than \$2 billion per year over the past five years.²⁵ This was only one-fifth of the investment in advanced economies, despite the need and opportunity being far greater in EMDE contexts.

²² IRENA, 2022, [World Energy Transitions Outlook 2022](#)

²³ IEA, 2021, [Energy Efficiency](#)

²⁴ E3G analysis based on Oil Change International, 2022, [Public Finance for Energy Database](#)

²⁵ IEA, 2021, [Smart Grids](#)



To reach universal energy access globally requires over 210,000 new mini-grids to serve 490 million people, requiring a total investment of \$220 billion.²⁶ However, 60% of MDB funds for energy access go to transmission and distribution-related projects.²⁷ **Though building grids for the renewables transition is critical, small-scale solutions will provide development benefits on the ground most quickly**, and do not come at the expense of significantly expanding utility-scale grid-integrated renewables. Small-scale energy solutions such as mini-grids can also boost electricity demand (with productive load penetration), making low-demand areas more attractive for grid extension.

Given all these investment needs, **currently MDBs finance only 1.2% of the public investment needs for small-scale energy solutions, which are estimated to be at least \$302 billion** (Figure 2).²⁸

Figure 2: The average annual investment gap for small-scale energy solutions.



Source: E3G analysis based on Oil Change International, 2022, *Public Finance for Energy Database*

²⁶ ESMAP, 2019, *Mini Grids for Half A Billion People: Market Outlook and Handbook for Decision Makers*

²⁷ E3G analysis based on Oil Change International, 2022, *Public Finance for Energy Database*.

²⁸ E3G analysis based on Oil Change International, 2022, *Public Finance for Energy Database*. This is an approximation and not an absolute figure as there is little data available on the energy finance provided via financial intermediaries. Public investment needs are based on the average annual investment needs for flexibility measures including storage according to IRENA, 2022, *World Energy Transitions Outlook 2022*, energy efficiency based on IEA, 2021, *Net Zero by 2050*, and mini-grid generation based on ESMAP, 2019, *Mini Grids for Half A Billion People: Market Outlook and Handbook for Decision Makers*, as a few examples of small-scale clean energy solutions. This was then taking a benchmark of a 30:70 ratio of public to private finance according to IEA, 2021, *World Energy Outlook 2021* and compared to the average annual investment in the energy sector in net zero scenario by IEA, 2021, *World Energy Outlook 2021*.



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What is holding the MDBs back?

MDBs commonly face barriers in at least two areas in scaling up investments in small-scale energy solutions: (i) their internal operations and project development structure and (ii) external demand from clients and shareholder governments who may prioritise more traditional larger-scale projects. These challenges lead to a persistent and enormous gap in investment for small-scale solutions.

In terms of internal operations, **the way projects are assessed within MDBs penalises small-scale projects.** At present, staff are incentivised to maximise the amount of money they lend, which naturally incentivises large projects. Additionally, when assessing emission reductions, it is easier for MDBs to opt for the replacement of coal plants with gas, rather than invest in small-scale solutions. Yet, this does not acknowledge the transformational effect of small-scale solutions on the overall energy system pathway. Moreover, small-scale projects are more expensive for MDBs to prepare and administer, given their granularity.

In terms of external demand, **governments' mixed signals toward the clean energy transition and persistent bias toward increasing supply of electricity over managing demand also threaten efforts to increase small-scale investment.** For instance, energy efficiency is not systematically considered or prioritised when policymakers make decisions about the energy system. Additionally, given their small-scale nature, projects on energy efficiency might be seen as a lower priority compared to large infrastructure projects. Governments also often prefer grid-connected infrastructure because they perceive them as having the largest-scale impact on economic development, or because they correspond to long-standing pledges or political promises. Strategic shifts within MDBs require shareholder governments' active participation to happen.

Seven steps to rapidly increase small-scale energy solutions in MDBs

MDBs and their shareholders through their constituencies should actively support the following seven steps:

1. **A common pact for how MDBs will help to unlock the massive development benefits from small-scale energy solutions.** This should prioritise emerging and developing economies (EMDE) that urgently need access to finance and de-risking mechanisms in the current crisis context. MDBs need to come in



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with their financial additionality, such as the development of innovative financing instruments and de-risking mechanisms. They also need to provide non-financial support, such as driving regulatory change and knowledge building. MDBs, especially with regional presence through country offices, should actively try to build up new clients and networks to design small-scale projects.

2. **Shareholder governments must play a more effective and vigorous role in realising the benefits of small-scale energy solutions.** Governments should integrate them into the national energy transition and development plans. This involves not only energy ministries, but also other agencies with the mandates of implementing the country's nationally determined contribution (NDC), energy transition or net zero strategies, rural electrification, finance mobilisation, and Sustainable Development Goals (SDGs).
3. **Fill data gaps by establishing a common database to increase transparency and accountability.** MDBs can deploy a common database that eases the tracking of projects in terms of the grants received versus scale-up achieved, and ensures that further grants demonstrate clear additionality. Harmonisation should occur across the MDBs and other DFIs in project development.
4. **Set targets for clean energy financing that align investments with net zero scenarios.** Across public and private finance, \$4.5 trillion annual spending by 2030 is needed – triple the current global investment. MDBs should scale their investments accordingly.²⁹
5. **MDBs' reviews of their energy strategy policies should target a percentage of their energy-related funding to small-scale energy solutions.** Based on the annual average energy-related investment need for net zero (see footnote 28 for details), this requires at least 20% of energy funding for small-scale energy solutions. This can be used as a benchmark for setting the target, along with the harmonisation recommended above. Currently, only the New Development Bank has surpassed this target, while the European Investment Bank (EIB) and European Bank for Reconstruction and Development (EBRD) follow behind with 15% (Figure 3).³⁰ MDBs should also support the development of specific financing facilities and provide technical assistance. With four MDBs conducting their energy policy review in 2022, the time is now to establish the required architecture.

²⁹ IEA, 2021, [Net Zero by 2050: A Roadmap for the Global Energy Sector](#)

³⁰ E3G analysis based on Oil Change International, 2022, [Public Finance for Energy Database](#)



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Figure 3: Percentage of small-scale energy investment in each MDB's energy-related financing compared to the 20% benchmark (red line).



Source: E3G analysis based on Oil Change International, 2022, *Public Finance for Energy Database*

Channelling this investment requires actively allocating money to specific areas and for MDBs to empower local partner financial institutions (FIs) and micro-financial institutions (MFIs). That will allow aggregation of small-scale projects and deployment of innovative financial instruments to increase the affordability of finance. Examples include de-risking instruments, guarantees, dedicated credit lines, and financial inclusion through provision of low-cost financial and credit services (concessional capital). Microfinance and mobile money can accelerate deployment of granular energy solutions, as demonstrated by the cases of Grameen Shakti microfinance services in Bangladesh, and M-Pesa mobile payment solutions in Kenya. There is no one-size-fits-all; these different types of instruments need to be matched with the local barriers, projects, and technology lifecycles that might vary between geography and small-scale technologies.

De-risking can provide lower borrowing costs, in turn providing opportunities to further crowd in private financial resources. This needs to be accompanied by technical assistance such as programmes to train local FIs, and to assist the government in providing a regulatory environment that will enable MDBs to further crowd in private investments.



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6. **Adjust incentive structures in MDB project development to allow small-scale energy projects to gain priority over larger fossil fuel projects.** MDBs' internal incentive structure should assess small-scale projects fairly, taking into account their emissions reduction potential and socio-economic benefits with a higher weighting. For example, impact assessments that look at access to affordable energy should fairly assess small-scale energy's higher impact than most traditional large-scale projects. At the staff level, MDBs must review organisational incentives that may penalise spending on small-scale projects, for example through metrics such as team spending targets.
 7. **Partnerships and transparency should be further strengthened by MDBs and their financial intermediaries who play a critical role in delivering small-scale energy solutions.** Partnership with intermediaries can be helpful to facilitate small-scale projects that are traditionally costly for MDBs. Subnational institutions, such as subnational and national development banks, can match local projects with investments from DFIs and are well placed to be the "project-makers" in small-scale infrastructure. Bundling small projects together can also help minimise costs. Paris alignment methodologies can support financial intermediaries in setting out pathways to both scale up investment in small-scale energy solutions and enhance availability of investment data. MDBs have a unique potential to support their intermediaries and green the financial system.

Additionally, MDBs influence financial intermediaries' operations through their policies and environmental, social, and governance (ESG) standards. With increased finance for smaller-scale projects, transparency needs to match intermediaries' increased importance. This means more rigorous reporting at project and sub-project levels. Persistent limited reporting and fragmented data complicate any independent assessment of how MDBs' indirect finance aligns with the Paris Agreement. The current development of MDB Paris alignment methodologies presents a crucial juncture.

Case study: EBRD's Green Economy Financing Facilities are a good example of partnership between MDBs and local financial institutions making small-scale energy solutions, in this case green technologies, available for homeowners and businesses. The platform provides finance, but also technical assistance and advisory services to help local FIs and their clients enhance their market practices. Using aggregation and digitisation, the Bank uses Green Technology Selector to simplify the process by pre-approving technologies and making them automatically eligible for financing through the participating local FI.

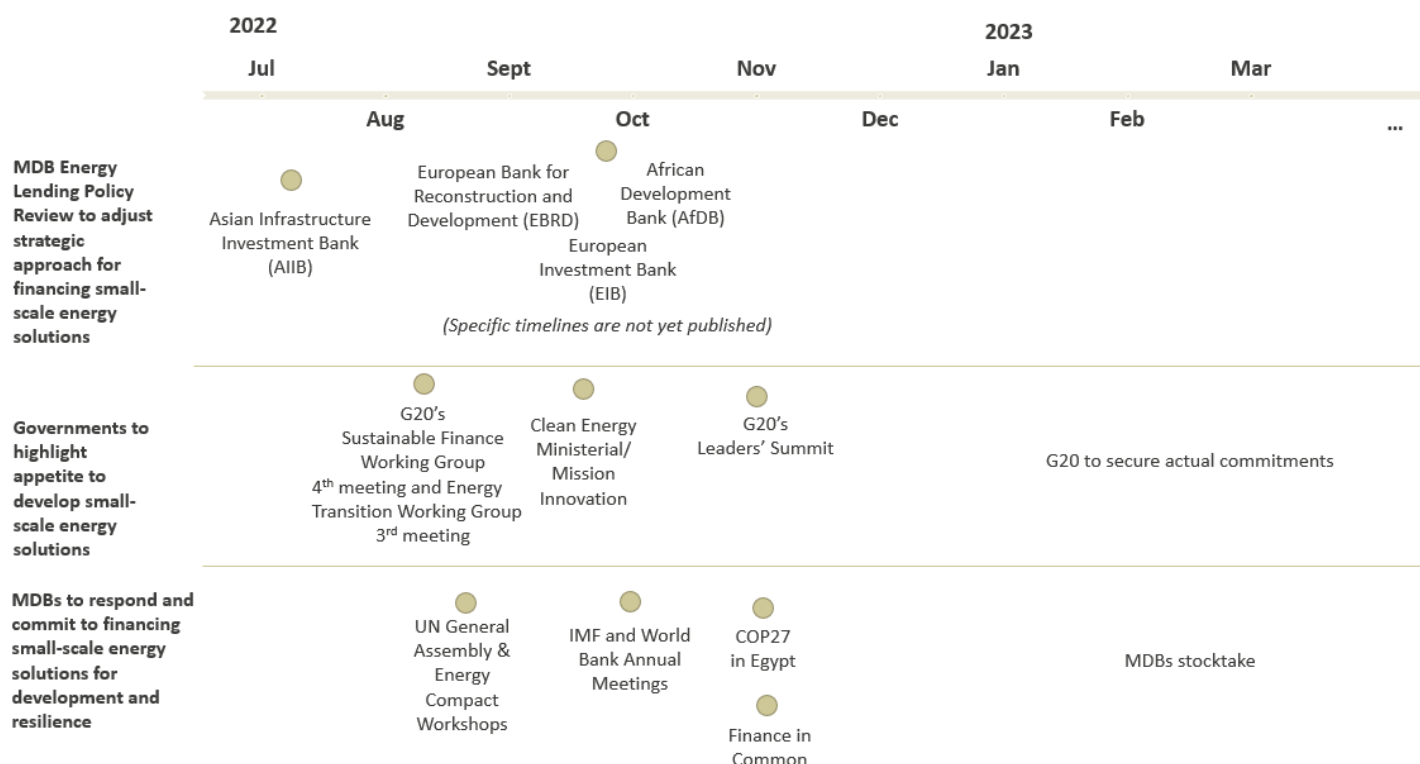


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International governance to enable investment at scale

As the urgency increases, the above steps require significant political signals to emerge from the international fora happening this year and next. Figure 4 illustrates how different venues and stakeholders can take this agenda forward.

Figure 4: Milestones for putting small-scale energy solutions on the international political agenda.



Governments should use their shareholder power to task MDBs with prioritising small-scale energy solutions for development and resilience. The G20 provides platforms for shareholders and host countries to signal their appetite for more investments in this sector. Likewise, the G7 plays an important role in setting the agenda for MDBs and can use their leverage within MDBs to focus attention to the seven required steps in this policy brief.

Meanwhile, MDBs' reviews of their energy lending policies being conducted in 2022 provide significant opportunities to focus attention on small-scale energy solutions. Accelerating small-scale finance should be a part of a multi-year strategy. Fora such as the G20 can secure the narrative shift this year and secure actual commitments in the year after. 2023 will also be important as a global stocktake and provide a big moment to establish what progress has been made.



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About E3G

E3G is an independent climate change think tank with a global outlook. We work on the frontier of the climate landscape, tackling the barriers and advancing the solutions to a safe climate. Our goal is to translate climate politics, economics and policies into action.

E3G builds broad-based coalitions to deliver a safe climate, working closely with like-minded partners in government, politics, civil society, science, the media, public interest foundations and elsewhere to leverage change.

More information is available at www.e3g.org

E3G Public Bank Climate Tracker Matrix

E3G's Public Bank Climate Tracker Matrix tracks how leading Multilateral Development Banks (MDBs) as well as Bilateral and National Development Banks worldwide are mainstreaming climate change into their work. This initiative strives to provide a standardised and replicable method to assess public banks' ability and readiness to achieve the required transformation under the Paris Agreement, highlighting positive steps and areas for improvement. Starting 2022, MDBs will be assessed on how they support small scale distributed energy solutions. The matrix can be accessed [here](#).

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