AMPERES & OXFAM

Mekong Community Power Association

PROSPECTUS

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April 11, 2022

About the prospectus

This prospectus outlines the need and scope of a regional association to promote community energy projects in the Mekong region. It is based on a review and consultations with community energy projects in the Mekong Region, Australia, Europe and Japan undertaken by AMPERES and Oxfam.

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About AMPERES

AMPERES is a mission-driven enterprise. We use evidence-bases, deliberative processes and innovative technology to improve how communities interact with the environment.

Acknowledgements

We wish to thank the Australians and Mekong citizens pioneering community energy projects for sharing their experience and insight from their community energy projects with our project team. We also acknowledge and appreciate the support, comments and guidance from a range of community energy practitioners, in particular: Dr Jarra Hicks (Community Power Agency), Ms Taryn Lane (Hepburn Wind), Dr Shota Furya (Institute for Sustainable Energy Policy), U Than Htay (REAM), Ms Nguyen Thi Ha (GreenID), Ko Gyi Phyo, (FREE), Ms Dipti Varghela (HPNET), Ms Bridget McIntosh (EnergyLab Cambodia), Ms Sharon Forrester (Ninti One), and Mr Daniel Abunales (Heinrich -Boell Stiftung)

Citation

AMPERES (2022) Mekong Community Renewable Energy Association: prospectus, Australia-Mekong Partnership for Environmental Resources & Energy Systems, Ho Chi Minh City.

OXFAM

AMPERES

PURPOSE OF THE DOCUMENT

In 2021 Oxfam's Mekong Water Governance Program commissioned AMPERES to undertake a review of Mekong experience with community energy projects and explore the feasibility of an organization to promote and advance community energy in the region.

This document summarises the main findings of the review process and outlines the priority focus and structure of a regional association.

The project was implemented April – December 2011 and adopted a case study approach analysing more than 20 community energy projects in the Mekong, Australia, Europe and Japan.

The review process resulted in a publication which was prepared with additional resources from the Heinrich Boell Foundation:

Le, H.T., Ham, O., Ketelsen, T., Keo., K., Sim, S. 2021. *Think Global Act Local: Exploring the role of community renewable energy in national achievement of an inclusive, just energy transition.* Heinrich Boell Stiftung, Bangkok Thailand December 2021.

Findings from the review were subject to an interactive design process between AMPERES and Oxfam team members, including three working sessions to draw lessons and deliberate on association design and a community-level stakeholder consultation with representatives from each of the community energy projects reviewed.

This prospectus summarises the value proposition and structure for investing in a regional community energy association, with suggestions on a strategy and steps to establishing the association.

The last mile leads

Distributed Renewable Energy catalyzes a shift in the equity of the Mekong's development trajectory.

Communities once on the fringe of development could become leaders in new, more equitable models of energy access and utilisation.

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SECTION 1

Community Energy in the Mekong

Community Energy systems are renewable energy projects developed and delivered by communities for the benefit of communities. They are distinguished by the level of engagement that communities have in the decision making, governance and management of renewable energy systems, and in how benefits of RE systems accrue at the local level.

By redefining ownership, governance and management of electricity services, community energy projects position communities at the centre of the renewable energy value-stack and offer communities a range of environmental, economic, social, political and technological benefits (Exhibit 1). These benefits extend beyond community control of electricity services to also include income for the community and strengthened community capacity in self-governance (Hicks, 2017).

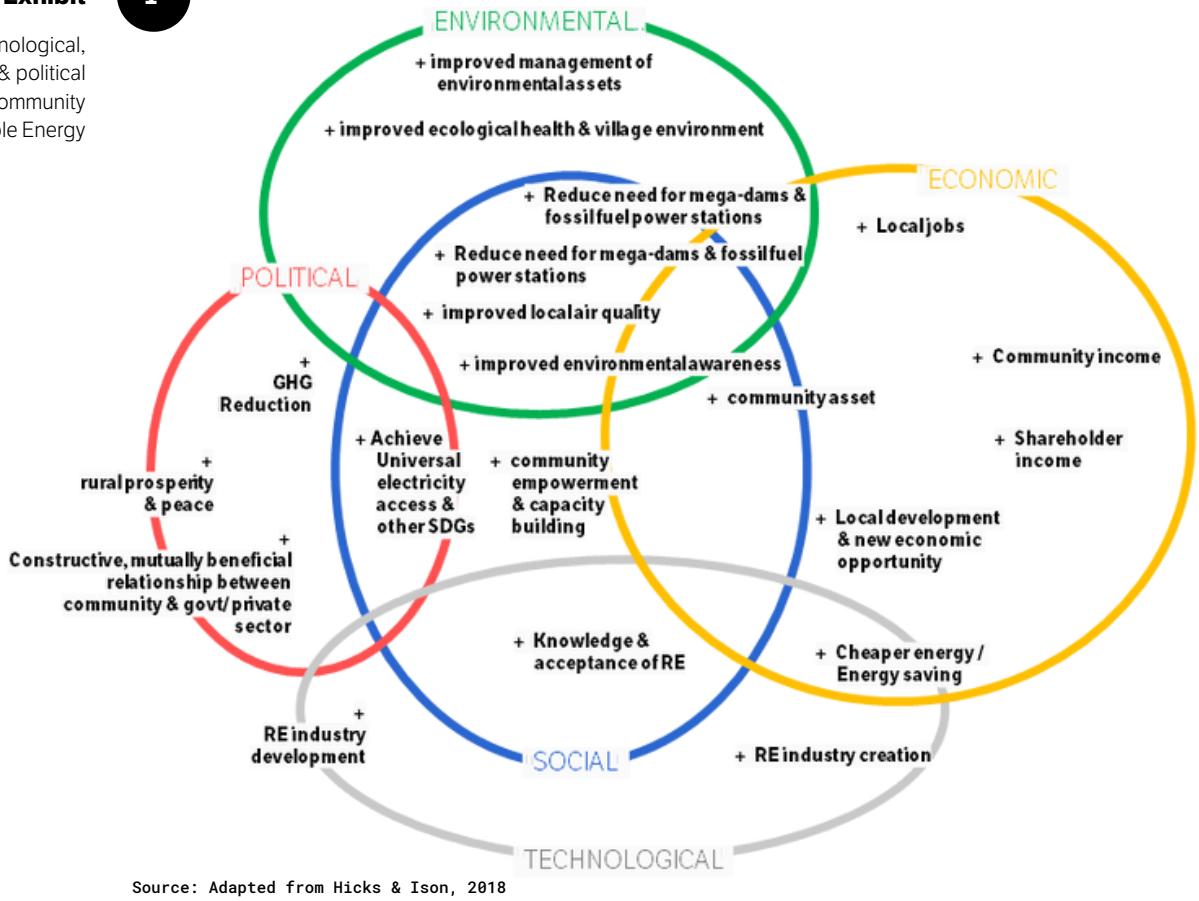
The rise of community energy projects is closely linked to the rise of distributed renewable energy technology, and the maturation of cooperative social enterprise models, which has seen these projects emerge first in developed nations like Australia, Denmark and Scotland (Le et al, 2021).

Today there is a thriving community energy sector with more than 4,000 projects globally, mostly in Europe, North America and Australia (IRENA, 2020).

In Australia there are political efforts in Federal parliament to promote an AUD 483million plan to develop 10,000 community energy projects across rural Australia (Haines, 2020). Like Australia's gold rush of the 19th Century, and agriculture boom in the 20th, community renewables could be the foundation of booming prosperity and rejuvenation in rural Australia.

Exhibit 1

Social, technological, economic & political benefits of Community Renewable Energy



Source: Adapted from Hicks & Ison, 2018

In contrast to the developed world where community energy has evolved as an income generating strategy, in the Mekong, community energy systems have arisen in response to local needs for electricity access and as a cheaper, faster alternative to grid extension. Every country in the Mekong has some experience with Community Energy Systems.

MYANMAR

During a previous period of military dictatorship (1980s – 2015), the central government spent little effort to expand grid electricity services to remote ethnic communities in the country. These communities utilised local resources to develop at least 6,000 mini/micro hydropower projects in the mountains and 500 biomass gasification projects in the lowlands for village electrification, and a further 10,000+ biomass gassifiers for rice mills (MEENet, 2017; MRI, 2014).
Mini-grids were typically developed by local private sector with some form of community management and/or ownership.

CAMBODIA

Cambodia's progress on electricity access has been slower than other Mekong countries (e.g., Thailand and Vietnam) but has accelerated during the last decade.
Grid expansion was, and continues to be, the main strategy of the Cambodian government's provision of electricity services to the last mile population.
However even on the grid, more than half of Cambodian households are provided electricity not by EDC, but by Rural Electricity Enterprises (REEs) with REEs negotiating service conditions directly with communities (Le et al, 2021).
In off-grid areas communities are developing a wide range of mini-grids including hydro, diesel and solar, and in some cases targeting electricity production for centralised battery charging rather than installing distribution lines.

VIETNAM

Until 1993 Vietnam showed limited progress on rural electrification (<14%). By 2004 this rate of access had reached 87%. During that period of rapid expansion in electricity services, Commune Energy Groups (CEGs), District Energy Groups (DEGs) and local cooperatives provided the majority (50-70%) of rural electricity supply (Le et al, 2021). CEGs and DEGs were controlled by Government but also comprised many Community Energy features – they relied on small-scale generation exploiting energy resources located close the community loads (micro and pico hydropower was particularly important), and there was open channels for discussion and influence between local community and local government in terms of management of energy systems.
The passing of the Electricity Law (2004) ultimately saw local involvement diminish ceding governance to the centralised state-owned monopoly EVN.

LAOS

Community Energy is less documented and extensive in Lao PDR.
In mountainous rural areas of northern and central Laos, communities have built pico-scale run-of-river hydropower projects with the capacity for generating kW scale power. Typically, this generation was used to power specific loads, or to centrally charge batteries, not for village-scale grids.

Design of the Mekong Community Power Association was based on a review of 15 existing community energy projects in the Mekong region and consultations with key stakeholders from those projects.
A wider review of an additional 10 projects from Australia, Japan and Europe was used to supplement the Mekong findings.

MYANMAR

1. Htan Hla Pin Community hydro microgrid (Htan Hla Pin Village, Southern Shan State)
2. Recycled Li-ion Batteries for solar home systems (Pan Nyo Village, Magway Division)
3. EKO hydro micro-grid (3 Townships, Southern Shan State)
4. Hivos hydroi micro-grid (Shan State and Kachin State)
5. Community hydro micro-grid (Taunggyi, Southern Shan State)
6. Solar irrigation pumping in Central Dry Zone (Kyaut Pa Htaung, Nwar Hto Gyi and Yaesakyoe Townships, Sagaing Division)
7. Biomass plant (Ayeyarwady Delta)

VIETNAM

1. School rooftop solar power system (Quang Trung Secondary School, Dak Lak)
2. Community solar & water system (Krong-Bong District, Dak Lak)
3. Solar home system (Tinh Bien and Tri Ton District, An Giang)
4. Solar home system for poor offgrid households (Chau Thanh District, Soc Trang)
5. School rooftop solar power combining clean water system (Go Cong Tay District, Tien Giang)
6. Cao Bang Solar home systems (4 districts in Cao Bang)

CAMBODIA

1. Small hydropower (Siem Bouk, Strung Treng)
2. Solar battery charging (Lumphat, Rattanakiri))

Veal Kambor community solar-powered battery charging station

The Veal Kambor community battery charging station is located within a Community Protected Area (CPA) of the Lumphat Wildlife Sanctuary in Rattanakiri province. The Community Renewable Energy (CORE) system serves approximately 536 families (>2,000 people). The solar system replaces an old diesel generator and has the capacity to charge 30 to 40 batteries. It has provided local villagers with a cheaper alternative for charging batteries and reduced travel time, as the diesel charging station was located farther away in town.

The system was established with a grant from an NGO who helped the charging station operator (a local business) to consult with community representatives and local villagers and design a community-centred system, with local community contributing in-kind support through the provision of land and labour. Income from the charging station was used to support forest protection activities and ranger services in the CPA.

Koh Sampeay community's mini-hydropower dam

Koh Sampeay is a ethnic lao village in Stung Treng province. Community livelihood is dependent on Mekong fisheries supplemented, more recently, by eco-tourism. The village had no grid access and relies on kerosene lamps and car batteries for basic lighting. A local business built a small (12kW) micro-hydro project on a local stream. A local NGO worked with the private operator to expand the system to 40kW to also provide electricity to the whole community.

The NGO negotiated a tariff and establishment of a dam committee. Community members would pay for electricity use and the revenue was distributed to community development activities (50%), the community's dam committee (20%) and 30% to the private owner.
After ten years of operation, the arrival of the grid saw community consumption from the hydropower microgrid diminish and the system now operates for use only by the private sector owner.

Earot village community water – energy systems (Central Highlands)

Earot is an H'mong ethnic village in the Dak Lak with no connection to the national grid and no potable water supply. A Vietnamese NGO facilitated community consultations to explore options including grid extension, distributed microgrid and battery charging station. After reviewing the economics the community opted for a solar+ battery microgrid with excess electricity used to run a new RO water filtration system which provided bottled reliable drinking water and electricity to 23 households and a church.

The local community contributed land and labour, and the local commune-level government was actively involved. Revenue from selling electricity and water is used to support the management and maintenance of the system.

An Giang Solar Home Systems (Mekong Delta)

There are tens of thousands of rural households of the Mekong delta without grid access. A Vietnamese NGO worked with the local Women's Union to design a solar home system program designed to reach 1,000 households by 2022.

A technical group of community members was established to install and maintain solar+ battery home systems, as well as offering a financial subsidy to community members to purchase a home electrification pack including solar PV, batteries, roof-mounting and lighting.

School Rooftop Solar & water system (Mekong Delta)

A solar powered rooftop-water purification system was installed in Nguyen Van Nhieu Primary School in Go Cong Tay district (An Giang), an area that usually experiences salinity intrusion in the dry season. The system has a design capacity of 3 kWp and serves a total of 368 students in 13 classes and 28 teachers. It is integrated into the national grid and helps the school earn additional income, particularly in the summer through selling the excess electricity to the grid. The system also provided treated drinking water to the families of students during the dry season. The system is funded by the NGO GreenID, operated and managed by the school.

Pro-poor solar home systems for off-grid houses (Mekong Delta)

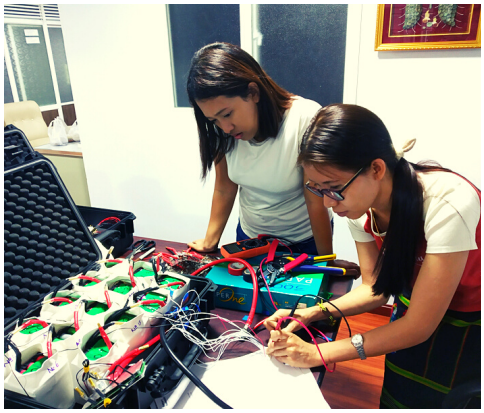
An NGO, a local association for people with disabilities, and Can Tho University designed a solar home system program to support off-grid and fringe grid households of Soc Trang province install solar home systems.

The program including consultations and training for local households as well as technical support for installation and maintenance of systems, with households required to purchase the equipment themselves.

Pan Nyo Community battery charging (Central Dry Zone)

Pan Nyo village is an off-grid Bahmar community in the central dry zone of Myanmar.The community has used car batteries for basic lighting but costs and difficulty in charging has meant the majority of household loads were met with fuel-wood.

The project protoyped recycling of old laptops sourced in Yangon to produce 2.5kWh Li-ion home battery packs. A cadre of villagers were trained in how to assemble their own batteries, and install and maintain them; and a central solar charging station was built. Five home battery systems were built with project grant funds, more than 12 more have been built by the community since the end of grant funding.



Htan Hla Pin Community-Led Hydro Mini-Grid (Shan State)

A 60KW mini-hydropower system was fully funded by the community with the technical support of the local entrepreneur HyCEM. The Htan Hla Pin Village Electricity Committee manages all activities in the supply chain and system maintenance.

The system has been providing electricity for 235 households for lighting, cooking, TV and phone charging for 17 years. Volt meters were installed in every house allowing households to measure loads and self-regulate peak loads especially when each household used their rice cookers.

Htan Hla Pin Community-Led Hydro Mini-Grid (Central Dry Zone)

The project provided 50 farmers with solar pumping and water dripping system to improve irrigation effectiveness. Depending on the size of the farmland and crops, a 500W, 750W or 1500W solar system was installed for pumping.

The program was managed by the Renewable Energy Association Myanmar (REAM) who also set up a technical support office in a township and supported farmers with technical issues. The solar pumping allowed for year-round irrigation and cropping activities in one of the driest areas of Myanmar.

Biomass gasifiers (Ayeyarwady Delta)

The gasifiers turned rice husk into electricity, thereby providing energy access to off-grid villages and electricity for production activities such as rice milling and water pumping.
Royal Htun Linn Manufacturing Co. Ltd. (RHL), a local enterprise, invented the Zero Toxic Biomass Gasifier Technology that significantly reduces water consumption in the process, generates no liquid discharge and decrease the cost. 4 systems The systems were funded totally by the community or through cooperation with other entities. .

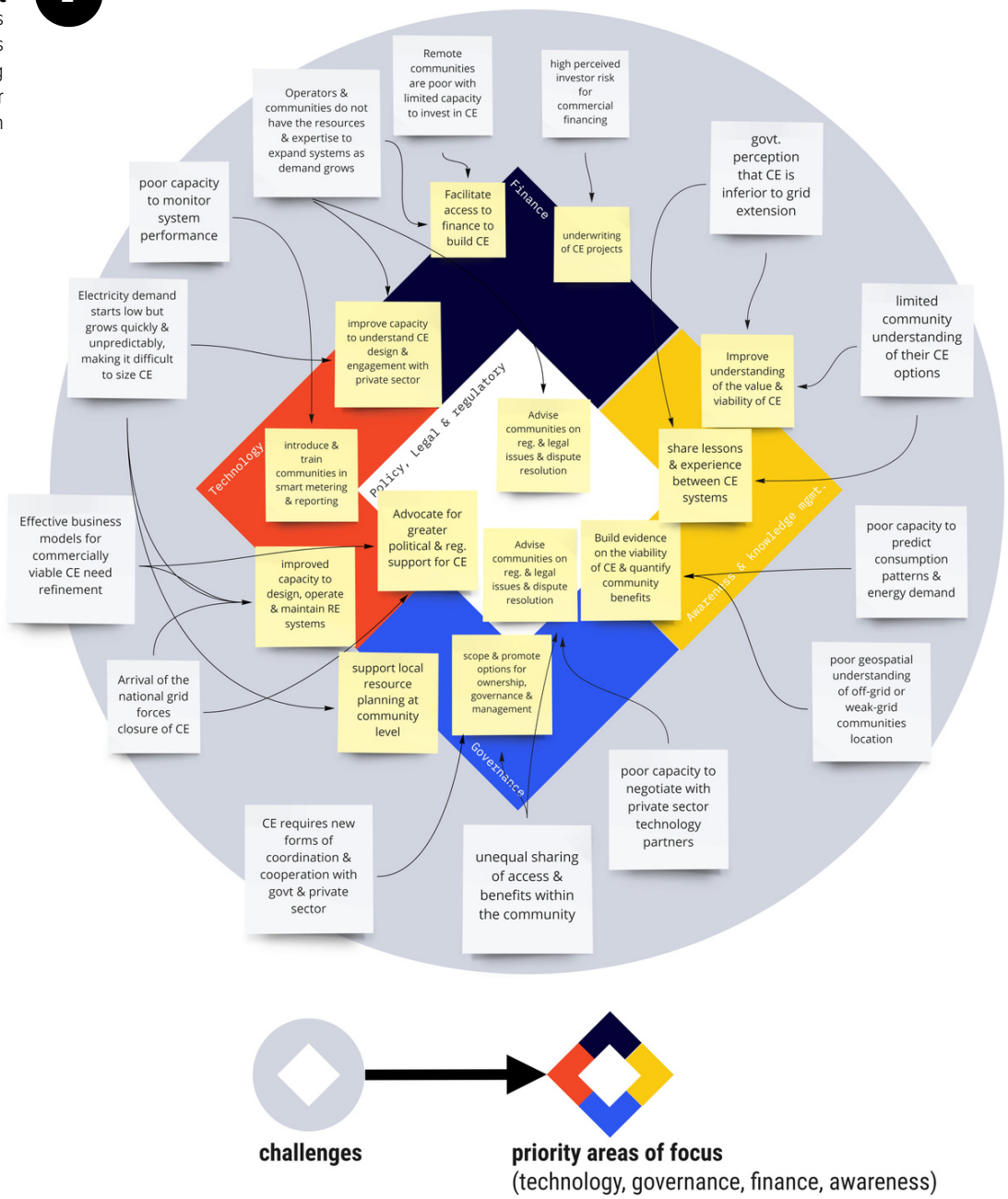
The barriers to community energy in the Mekong

Consultations with case study communities, practitioners of community energy in the Mekong, Australia and Japan, and a literature review revealed a suite of challenges and barriers to advancing community energy in the Mekong.

These barriers were analysed during a working session involving AMPERES, Oxfam and key Australian community energy practitioners and used to identify key priority areas of focus covering technology, finance, awareness, knowledge, governance and policy aspects of community energy projects (Exhibit 2).

Exhibit 2

Summary of Challenges (GREY) and key priorities (YELLOW) for a Mekong Community Power Association



SECTION 2

Towards a Mekong Community Power Association

The climate, economic and social case for community energy

Generations of Mekong communities have shared the distributed benefits of the Mekong commons, fish, floods and fertile plains. In recent decades large infrastructure – especially energy infrastructure have degraded and destabilised the ecological foundation of the Mekong commons, with rural communities bearing the brunt of the adverse impacts. Built for the national good, these infrastructure have also failed to deliver benefits equally and rural, remote and ethnic communities have lived on the fringe of the success story, lagging behind on many SDGs.

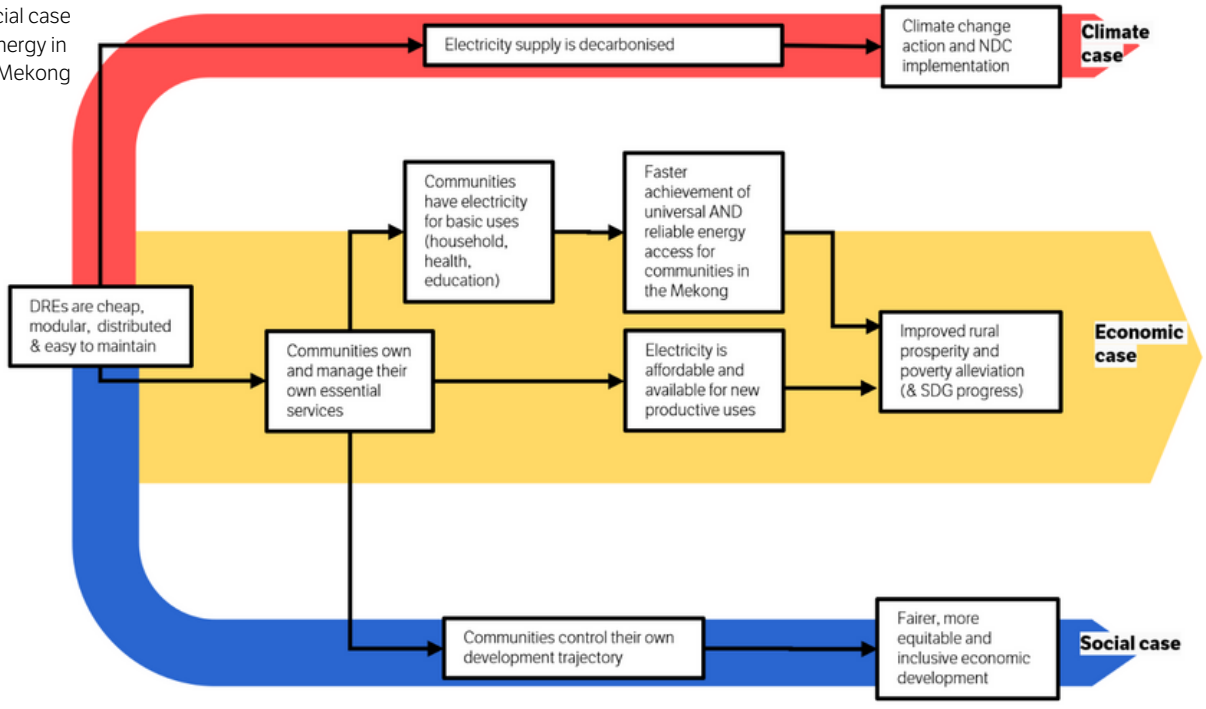
The last mile to receive essential services like electricity and water, these communities continue to battle poverty, food insecurity and economic prosperity. Today millions Mekong citizens still do not have access to electricity and millions more suffer from blackouts, brownouts and unreliable electricity services (IFC, 2020).

Community energy offers a transformative potential to break the mould of centralised, city-centred service provision.

It allows rural, remote and ethnic communities to build, manage and even own their own electricity services. This model provides communities with strong social and economic benefits, but also an important contribution to climate action (Exhibit 3).

Exhibit 3

Establishing the climate, economic and social case for community energy in the Mekong



The lessons learnt from the review of community energy in the Mekong and globally point to three clear pathways to improve the process and outcomes of energy access for Mekong Communities (Exhibit 4). These three pathways set the agenda for a Mekong Community Power Association to contribute to a sustainable and just energy transition in the Mekong.

PATH A: MORE BENEFTIS FOR LOCAL COMMUNITIES FROM UTILITY RE PROJECTS

The renewables boom is seeing a proliferation of utility scale wind and solar projects across the region. These major investments can cause conflict and adverse impact with local communities. The Mekong Power Association should support utility scale projects to improve their environmental and social governance and build legitimate social license to operate by sharing of tangible benefits with communities.

PATH B: MORE INVOLVEMENT OF LOCAL COMMUNITIES IN RURAL ELECTRIFICATION

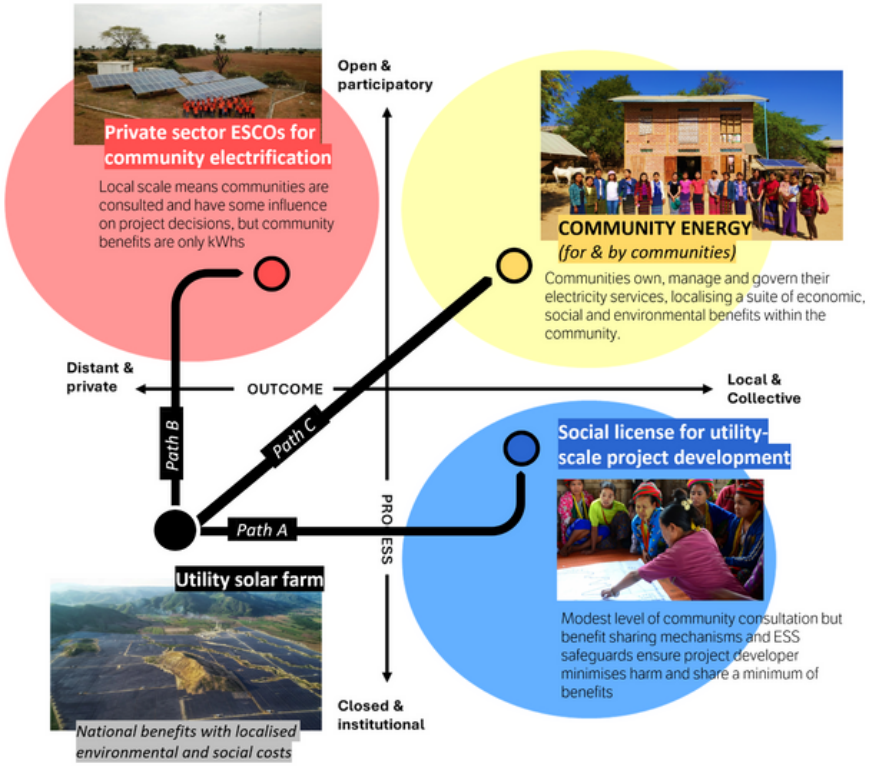
Renewable energy unlocks the opportunity for private-sector operated distributed mini-grids, these technologies can be deployed quicker and cheaper to help achieve universal, reliable electricity access. The Mekong Power Association should support the private sector to better involve communities in decision making about the size of projects, tariff structure and nature of service provision.

PATH C: COMMUNITY ENERGY PROJECTS FOR AND BY COMMUNITES

From a community perspective, the best outcome is for rural and urban communities of the Mekong to own and manage their own distributed renewable energy systems. Community owned systems will provide affordable electricity for essential home use and new productive uses, as well as unlock the opportunity for new productive services.

Exhibit 4

Pathways to advance community energy in the Mekong



There are three priority areas of focus to advance community energy in the Mekong region: a regional association to promote, support and advocate for community energy; a regional power hub scheme; and a community investment & safeguards scheme (Exhibit 5).

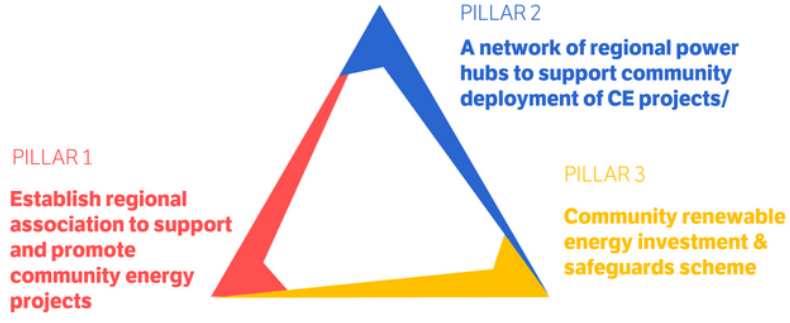
The first pillar would establish a regional association to support and promote community energy projects in the Mekong. The regional association would have an important role in raising awareness with a wide range of stakeholders on the value and feasibility of community energy as a contribution to SDG7 (universal access), as well as documenting and sharing lessons and success from existing community energy projects. It would also serve as a technical support hub providing policy reform advice to enable community energy and developing guidelines and standards for safe, efficient operation of community energy systems.

The second pillar would establish a network of local community power hubs deployed at the subnational scale. Power hubs would be hosted by trusted NGOs operating in the area with established connections and relationships with communities and local government. The hubs would operate as a one-stop technical support shop to help communities explore the feasibility of CE in their village, connect with the appropriate private sector service providers, obtain necessary government approval and negotiate ownership and management structures. The regional hubs would also support communities to access financing including through management of an MCPA fund.

The third pillar would work with conventional private sector renewable energy projects, such as utility scale solar and wind farms, to improve the sharing of benefits with communities. This would include improved environmental and social safeguards, guidelines and certification for Just energy projects and an underwriting facility for those projects that include community ownership in the project.

Exhibit 5

Three pillars of focus for a Mekong Community Power Association



PRIORITY FOCUS FOR MCPA

PILLAR 1

Establish regional association to support and promote community energy projects

The Mekong Community Power Agency (MCPA) would focus on three main activities:

1. Collect evidence and build a business & policy case for community energy microgrids as the economic, sustainable and preferred option for achieving universal electricity access for remote, rural and disadvantaged communities in the Mekong and pursue policy reform to that end.
2. Attract and facilitate the flow of capital into community energy projects, including set up a CE Fund and develop concessional financial products that suit both communities and investors.
3. Coordinate the sharing of lessons between Mekong CE projects and foster a CE community of practice.

PILLAR 2

A network of regional hubs to support community deployment of CE projects

Mekong communities are diverse, and few have the technical, legal and financial skills needed to develop community energy projects. The MCPA would establish a network of Local Power Hubs, hosted in established, respected NGOs at the provincial level. The local power hubs would:

- Promote and raise awareness with local communities about the benefits of CE projects.
- Support communities to identify and confirm the feasibility of CE projects.
- Connect communities with relevant technical developers and also provide in-house technical expertise and advice.
- Support communities to apply to the MCPA CE Fund and access other development capital funds.

PILLAR 3

Community renewable energy investment & safeguards scheme

The safeguards scheme will support the improved environmental, social and governance performance of large utility scale renewables projects, securing tangibles benefits for communities in terms of benefit sharing and inclusive decision making.

The scheme would:

- Provide MCPA technical assistance to private sector project developers in sustainability assessments .
- Underwrite project investment and provide financial certainty for projects that have a minimum 51% community ownership in the project.
- Establish guidelines and a certification standard for Just Energy Projects.

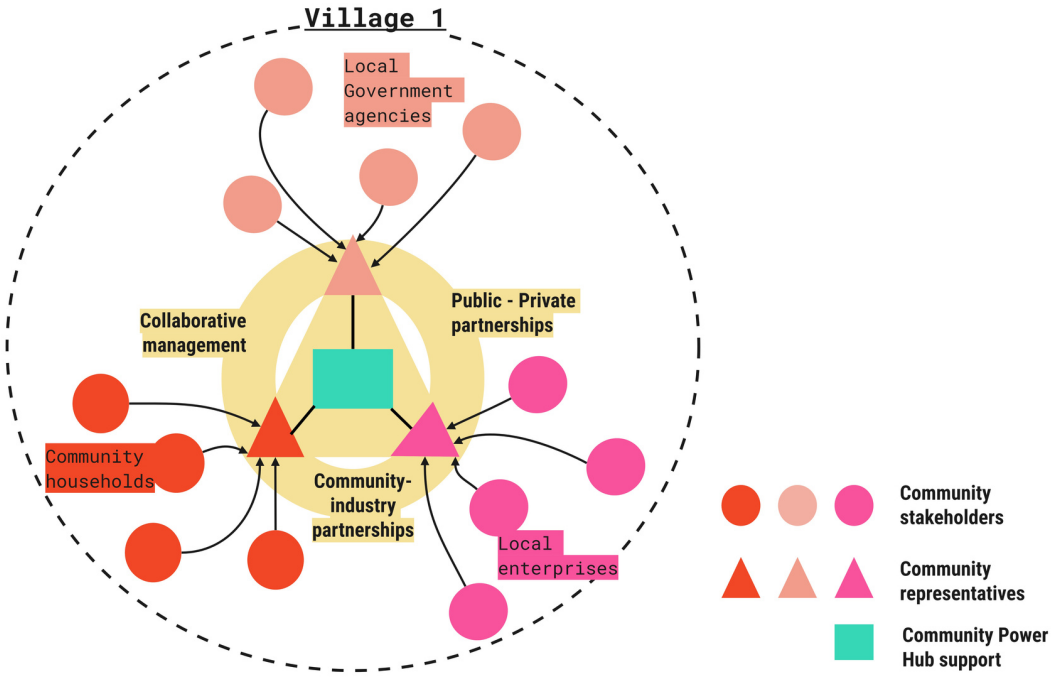
Supporting and promoting inclusive community managed energy systems in the Mekong.

At the community level the MCPA Local Power hubs will provide technical support to communities across the full spectrum of Distributed Renewable Energy project development, including:

- **Project understanding and feasibility**: local power hubs will raise awareness amongst villages about the benefit and potential for CE projects to support community electricity access and village economies, they will deploy technical assistance to review and understand energy demand patterns as well as review feasibility of appropriate CE options (technical design, and business model) and facilitate consultations with community stakeholders to achieve consensus on whether and which option of project is preferred.
- **Design and commissioning:** the local power hubs will facilitate introductions, negotiations and cooperation between community representatives and private sector and government actors involved in the detailed design, equipment supply, approvals and build of the community energy project. This will utilise guidelines and templates designed to ensure fair involvement and representation of the community throughout the process, and will also involve supporting the community to access concessional loans and grants to establish the project.
- **Operations and maintenance:** the local power hub will provide training to community representatives in all aspects of system management from maintenance, system performance monitoring, tariff management and accountability reporting.
- **Upgrade:** The local power hubs will serve a centralised role in monitoring system performing, providing advice on the need and scale of system upgrades and consolidating best-practice recommendations from each village experience.

Exhibit 6

The inclusive governance model for Community Energy Projects



Scaling community managed energy systems across rural regions of the Mekong

Local Power Hubs (LPHs) will be established with a host NGO that has an office in the regional town-centre. The MCPA will go through a process of training for the NGO and provide them with materials to equip the staff to provide village-level technical support.

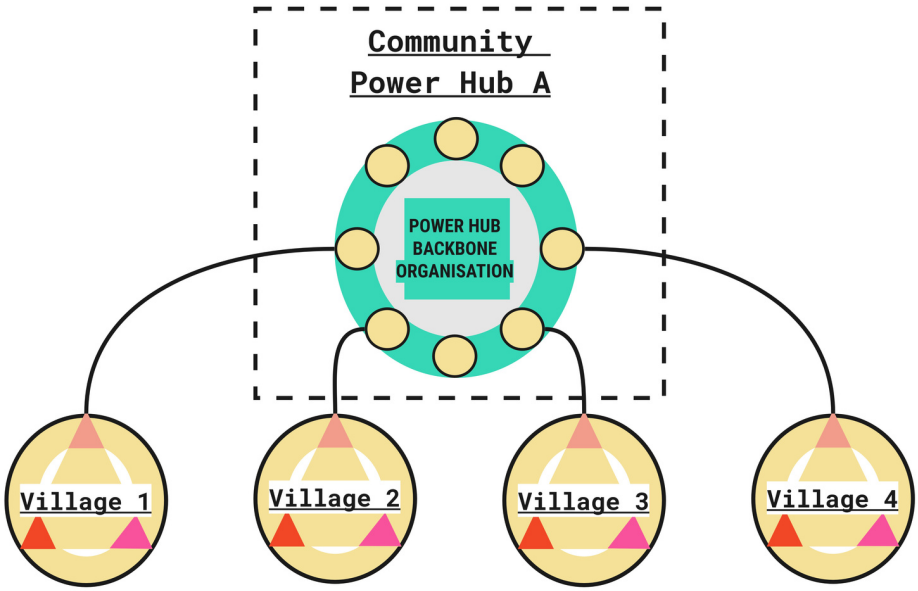
The Local Power Hubs would serve as a 'one-stop-shop' for local communities interested to explore and develop community energy projects, providing information, technical assistance and access to financing.

Selected host-NGOs, serving as LPHs , would be provided with a budget to cover operational costs associated with supporting villages, reviewing system performance, consolidating lessons and experience and coordination peer-to-peer learning between villages. A key element of the support would be convening regular meetings between community energy project stakeholders to share experience and promote the initiative to new villages.

The LPHs would also provide the first point of contact in representing the community interests to the wider group of stakeholders involved in the delivery of community energy projects, and seek to enforce good governance and environmental and social standards for project implementation.

Exhibit 7

MCPA Local Power Hubs: At the subnational levels community power hubs will provide direct support to communities developing CE projects



A Regional association to advocate and professionalise community energy projects as a viable electricty access solution for Mekong communities.

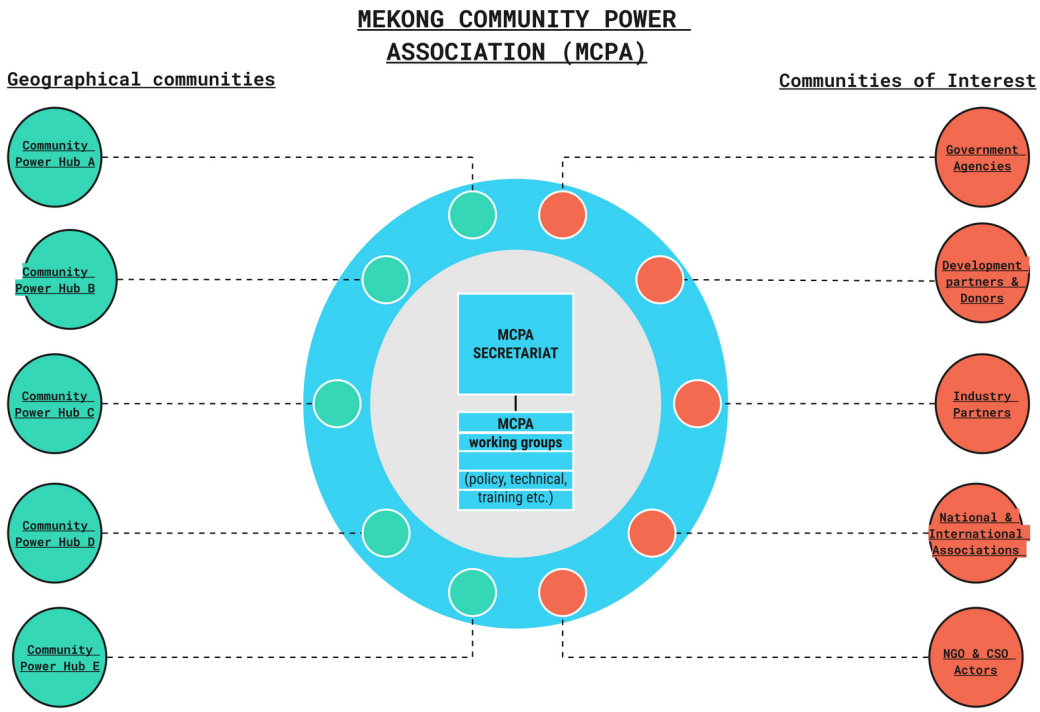
At the regional level an independent association would be established to coordinate, oversee and support all activities under the three pillars. The association would be include representation of two types of communities (exhibit 8):

- **Geographical communities:** The MCPA will include representation from each of the local power hubs within its committee structure, providing a link between village-level activities to regional forum.
- **Communities of interest:** The MCPA will also involve other stakeholders who share a similar interest in promoting and deploying community energy projects in the Mekong region. This includes government agencies, development partners and donors, industry partners, national & international associations, NGO and Civil Society Organizations (CSOs).

A secretariat structure will be established to effectively coordinate the association, oversee governance and administration. Design of the secretariat will also include scoping and establishment of working groups to provide technical. policy and advisory services to the secretariat, the local power hubs and communities.

Exhibit 8

Structure of the MCPA: At the regional level the MCPA will connect geographical communities and communities of interest to advocate, support and share lessons on Community Energy



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