



Project: Renewable Energy Skills Development in Indonesia

Implementation Consultancy Services: Terms of Reference

1 Introduction and background

Power generation from renewable sources becomes increasingly important for the sustainable economic development of Indonesia for three reasons. First of all, reliable access to electricity, which heavily correlates with economic development, remains low in remote areas of the widespread archipelago. To connect the remaining 31 million people and their businesses to the grid, renewable energy (RE) through solar, hydro, wind and biomass power plants plays a crucial role. It is the only cost efficient solution, since grid extension and centralized energy production in these regions would be prohibitively expensive and technically more difficult.

Secondly, to cope with the increasing demand of those who are already connected, mainly stimulated by the continuous economic growth, Indonesia requires additional power generation capacities. According to the countries 2018-2027 Electricity Supply Business Plan (RUPTL), at least 43.5 GW need to be constructed by 2024, of which 27% should come from renewable sources.

Thirdly, the government also depends on these technologies to reach its commitment to 29% greenhouse gas emissions reduction by 2030. Consequently, the country has set aggressive goals in its National Energy Plan (Regulation No. 79/2014) to increase the share of renewable energy in power generation to 23% by 2025, and 31% by 2050.

Despite of the increasing importance for sustainable development, renewable energy projects in Indonesia are still characterized with a very high failure rate at project level due to the lack of technical support for conceptualization, installation, operation and maintenance. The government has acknowledged that almost 10% of the off-grid renewable energy plants built in remote areas in the last seven years have already sustained significant damage¹. While scaling up the market for renewable energy does create more jobs, skills shortages remain a precarious issue. The immediate requirement for work force is estimated at 2,500 field operators and technicians, while the Ministry of Energy and Mineral Resources has estimated that Indonesia will need an additional 70,000 renewable energy professionals by 2025.

The Government of Indonesia (GoI) is aware of this skills mismatch and is committed to strengthen vocational education and training in order to provide qualified graduates meeting the requirements of the private sector. President Joko Widodo has pledged investments in

¹ 55 projects worth Rp 261 billion (US\$18.27 million) have sustained minor damage, while 13 others worth Rp 48.85 billion sustained heavy damage. This represents almost 10% of the 686 RE project constructed between 2011 and 2017.

Indonesia's human capital a second term priority and plans to increase the number of polytechnics to 500 from 280 by 2024. This upscaling is urgently needed since there remains to be a considerable gap in execution of both technical training and provision of relevant equipment to the schools. The training levels in Indonesia's vocational school system, implemented by Polytechnics, have not caught up to advanced technologies in the field of renewable energies and lack modular courses to offer continuing education for active labor force.

Against this background and in dialog with its Indonesian partners, SECO has developed a concept for a Renewable Energy Skills Development Project, which was assessed in 2019 through a detailed feasibility study. The feasibility confirmed the high relevance of the concept while suggesting a number of important adjustments:

- The demand in the labor market by the private sector is not upstream on the development of Renewable Energy technologies but clearly downstream around its application in power generation plants and network applications. In addition, the private sector requires staff with a degree at the tertiary level. Accordingly, the project should address only education at tertiary level with formal trainings at polytechnics and a series of non-formal modular trainings leading to the same professional level.
- The project will introduce an innovative model for multidisciplinary training that equips civil, mechanical and electrical engineers with the necessary RE know-how through a formal postgraduate study program in one year (instead of a multiyear program to become RE specialist). The content of this postgraduate study will subsequently be used to develop a number of non-formal short-term training modules for people already on the job, or people who aim at improving their employability.
- The project will develop a common national qualification standard, which will provide the RE industry with a much better orientation in the "jungle" of certifications in the sector. This has been assessed to be much more effective than an attempt to harmonize the different certification systems currently existing in the country.
- Higher education programs developed under this project will predominantly focus on hydro and solar PV technology, where most growth and demand for skilled experts exists.
- Due to the high interest on the Indonesian side in learning from the Swiss VET system, the project will involve qualified Swiss Polytechnics during preparation and implementation of training programs to foster know-ledge transfer and Swissness.
- To agree on clear targets and responsibilities for Indonesian partners throughout the project, they were defined specifically in the jointly developed logframe. This will improve ownership and mutual accountability, which proved to be difficult in similar projects in Indonesia.

These adjustments led to a highly relevant project for both, the Indonesian government as well as SECO. On the government side, it has triggered a lot of interest and ownership during its development in the responsible ministries and selected polytechnics. This is mainly because the project offers the introduction of a systemic approach to RE competency training, which is currently missing in Indonesia. On SECO side, the project is fully aligned with its principles on skills development, and therefore represents a great opportunity for SECO to expand its engagement in this sector in Indonesia. While the different set of partners in the GoI would not allow for a direct integration into SECOs existing projects², the potential for synergies and additional Swiss visibility are significant. Swiss visibility will further be strengthened through the

² Skills for Competitiveness (S4C) and Sustainable Tourism Education Development (STED)

direct involvement of Swiss polytechnics in the conceptualization and implementation of the project.

Since the feasibility has also identified a large potential to expand this project into a second phase in 2025, this mandate does also include an option to extend the collaboration into a Phase II. This would include the extension to one additional renewable energy technology, the collaboration with five additional polytechnics for the formal education and an expansion to five additional institutions for the implementation of the non-formal education modules. An external mid-term evaluation in 2023 will help to take an informed decision on this option. The implementation of Phase II is also subject to a financing approval of SECO.

The overall project implementation, including national and local stakeholders' engagement and donor coordination, will be led by an international consultancy selected through this open procurement. This procurement does also include the tendering for the implementation of option 1. Accordingly, all bidders are required to include the basic contract and 1 options in their offer. A partial offer is not accepted.

2 Description of the project

2.1 Objectives

The project objective is to enable competent design, planning, installation, operation and maintenance of RE plants through the availability of qualified staff relevant to labour market needs. This will be achieved through the availability of qualified personal with higher-level skills competencies graduating from relevant formal and non-formal tertiary level education and training programs. This will result in more and better jobs in the sector through an improved labour market matching that also stimulates the renewable energy market. In the long-term, the project will thereby also contribute to improved access to electricity from RE sources and a reduction of greenhouse gas emissions.

2.2 Scope of the project

To achieve the above mentioned objective, the project is structured into three components:

- **Component 1 - Formal education:** On the one hand, the project aims to achieve this through the development of a formal, multidisciplinary Renewable Energy specialization program taught at selected polytechnics. This shall attract civil, mechanical and electrical engineers that are coming out of a three-year formal education (graduating at D3³ level) and would like to add a Renewable Energy specialization through a one year graduate program (at D4 level). By bringing engineers from different disciplines together, this formal education promotes a multi- and transdisciplinary understanding with a thematic focus on renewable energy.
- **Component 2 - Non-formal education:** On the other hand, people already in a job, not willing to take a one-year break, but rather to do up-grading through short-term

³ Compare Feasibility Study Chapter 1.4

trainings, will be served through non-formal⁴ training modules developed based on the D4 specialization program. To do so the project will also support the development of higher national qualification standards along the lines of the established procedures in Indonesia.

- **Component 3 - Complementary Activities:** The development and implementation of the two programs under component 1 and 2 will be supported by a third component on aspects such as on knowledge exchange, awareness and provision of information around these activities.

Organization and governance

The program will be implemented bilaterally under an agreement with the Ministry for Energy and Mineral Resources (MoEMR), responsible for the planning of the future energy supply in the country. Within the ministry, the Human Resource Development Department (BPSDM) will act as the executing agency and lead the Steering Committee Meeting. At the operational level, BPSDM is expected to establish a project implementation unit (“unit pelaksanaan” in line with Indonesian regulations) and appoint a coordinator in charge for resource planning and implementation of the project activities in close coordination with other Indonesian counterparts. This work will be supported through an Implementing Agency (international consultancy) selected through this open procurement. The project has already identified five partner polytechnics for the development and delivery of the formal, multidisciplinary RE specialization program at D4 level. PPSDM Pusat Pengembangan Sumber Daya Manusia of MoEMR (who is one of the leading providers of short-term training in the field of electricity production and distribution) is the main partner for the non-formal modular trainings.

The implementing agency to be selected shall work in close technical coordination with the Project partners (BPSDM at national level and polytechnics) on the implementation of the project in order to ensure its successful, sustainable and timely execution.

Cooperation with the private sector

The cooperation with the main private sector stakeholders in RE will be a central element of the educational approach. They shall be invited to cooperate in all activities of the project. Companies such as Baywa RE, Vena Energy, UPC, Engie, and others, which were contacted during the feasibility study have expressed interest in collaborating closely to develop regular internship programs, which are well integrated into the workflow of the company. The private sector companies have also expressed interest in participating in curriculum development, providing subject matter experts and industry experiences to the polytechnics, and providing opportunities for the teachers and lecturers to collaborate potentially on industry relevant projects with the help of the students. The inception phase of the project will identify additional private partners and develop possible modalities to formalize their collaboration with the polytechnics. Private partners will be actively involved in all tasks described in chapter 2.1 for the components 1 and 2.

Geographical focus

⁴ In comparison with formal education, non-formal education does not provide a qualification recognized by the national educational authorities. However, non-formal education also has a clear structure in terms of defined objectives and achievable qualifications, is typically conducted by education providers in the form of courses, seminars or modules, and should therefore not be confounded with informal education.

In terms of geographical focus, the project was mainly guided by two factors: First, the ownership and interest as well as the qualification and thematic specialization of the polytechnics. Second, the proximity of the polytechnics location to existing RE power plants and private sector companies, as well as the potential of the region for future RE development. Finally the relevance of the supported RE technologies, which is higher in remoter areas of the Indonesian Archipelago. Accordingly, the project will directly cooperate with two polytechnics on Sulawesi (Makassar and Manado), one polytechnic in Kupang, and one polytechnic on Java (Jakarta). A fifth polytechnic under the lead of the line Ministry of Energy and Mineral Resources is being planned in Bali, but will become an important partner once operational.

Beneficiaries

There are a number of direct beneficiaries of the project: First of all the students and work force that will profit from professional academic and practical training on RE, as well as teachers that will improve their skills for professional training. Secondly, the five participating polytechnics and the governmental and private provider of non-formal education, which will directly benefit from the development of comprehensive curricula, teaching materials, equipped laboratories and finally approved degree and modular programs. Thirdly, the national government, namely the Ministry of Energy and Mineral Resources (MoEMR) and the Ministry of Education and Culture (MoEC), which will have access to two working models of applied renewable energy education at tertiary institutions, including curricula, teaching materials and laboratory standard operating procedures. Private companies directly engaged with the project would also immediately benefit from supply of skilled labor, and/or service for maintenance and repair. Indirect beneficiaries would include the local populations and businesses in the regions electrified through RE systems, where access to electricity becomes more reliable through better operation and maintenance of the RE assets.

3 Scope of the assignment

The assignment is to implement the Renewable Energy Skills Development (RESK) Indonesia Project in close collaboration with the Indonesian partners and according to the guidance received from the Steering Committee. The implementation mandate is phased, and contains a basic contract (phase I) described in chapter 3.1 and an option 1 (Phase II) described in chapter 3.2.

3.1 Basic contract (Phase I)

The basic contract of the Implementation Agency can be divided into the three main components of the Project: (1) Formal Education; (2) Non-formal Education; and, (3) Complementary Activities. Additionally, general project management activities fall into the assignment.

The main objectives of the Consultancy Services to be provided can be summarised as follows, however, are not limited to the activities listed:

During the Inception phase:

- Establish and staff a functional Implementation Agency team.
- Meet with all Project stakeholders to start the Project in a targeted and coordinated manner (preparatory and kick-off meetings). Establish a technical work relationship with the Indonesian partners and the members of the Steering Committee.

- Review, finalize and optimize the basic design of the project, in close consultation with the Indonesian partners. Establish working agreements and a project communication concept with the main partners.
- Confirm and detail the project approach with the main partners and the five selected Polytechnics with the aim to agree on a general project implementation plan (GIP) and a detailed yearly plan of operation.
- Review and confirm indicators to allow the Steering Committee to steer the Swiss and Indonesian inputs to the project actively and to take steering decisions at any point of the project implementation.
- Initiate and support the establishment of an Indonesian Implementation Coordination Committee to take over the implementation coordination on the Indonesian side.
- Deliver final Project Document (Prodoc) based on the feasibility study (Annex 2) and the work conducted during the inception report. The document shall include a revised LogFrame (incl. baseline and target values to assess the Project outcome and long-term impact) and respective budget and is accepted by the Steering Committee.

Project implementation:

- Assist and monitor the Indonesian partners in the execution of their task. Manage and supervise in cooperation with the Indonesian Partners the successful implementation of the Project within the given time frame, at the highest quality and within the budgetary limits.
- Enhance operational, financial and managerial capacity at Ministry, Polytechnic and training centre level.
- Support the development and successful implementation of a formal renewable energy specialisation programs in close cooperation with Polytechnics and the private sector.
- Support the development and successful implementation of a series of modular, non-formal renewable energy specialization training programs.
- Ensure the active involvement of the private sector in all relevant tasks.
- Foster the exchange of experience and knowhow from Switzerland through the collaboration with selected Swiss polytechnics.
- Foster knowledge and information exchange as well as awareness raising in the renewable energy sector between various stakeholders.

The following sub-chapters will further detail the tasks the Implementing Agency will have to perform during the implementation of the RESD project. The services to be provided under the contract with the Implementing Agency can be allocated to the activities described in chapters 3.1 - 3.5. Each of these activities can be subdivided into several tasks. The scope of the services of the Implementation Agency will include, but not be limited to, the tasks described in the following sections. The Implementing Agency has to identify if the Indonesian system already provides respective mechanisms, and in case it does, it shall support and strengthen these mechanisms (under clear agreements with partners), only as a last resort the project shall, in cooperation with partners, create new systems.

3.1.1 Component 1 - Formal education

The main partners in the component 1 are the Polytechnic schools in Makassar, Manado, Kupang, Jakarta and Bali. The Polytechnic EBT in Bali, which is directly under the Ministry of

Energy and Mineral Resources, will require special attention, as it is the only Polytechnic in the project not directly below the Ministry of Education and Culture (MoEC).

This component shall develop D4 level RE specialisation programs (for electrical, mechanical and civil engineering graduates) and ensure that implementation of the programs is supervised in cooperation with Polytechnics and private sector. All relevant stakeholders are expected to be involved.

The outcome of the activities conducted under the component 1 shall be: “formal, multidisciplinary RE specialisation programs at D4 level are in place and produce labour market relevant graduates for the RE sector”. It is expected that participating polytechnics should be able to enrol 120 students per program and year starting 2023. This would mean that by 2025 about 900 specialised graduates with D4 degree in solar and hydro that fit labour market requirements will be trained by the participating polytechnics.

The Implementing Agency shall work closely with the Polytechnics and the departments of two line Ministries involved (BPSDM and MoEC) and their implementation units (UPT “unit pelaksanaan teknis”), and also with representatives from the private sector while conducting the work under this component. The Implementing Agency’s work includes, but is not limited to the following tasks

- **Task 1.1:** Define the learning outcomes, structure and preconditions for a one year “post graduate” D4 program specialized in solar, solar hybrid and hydro RE production. Conduct labor market assessments and “DACUM^[1]” workshops in collaboration with the government, Swiss and Indonesian polytechnics and private sector companies. This requires the preliminary identification of interested and relevant Indonesian, regional, international and Swiss private companies in the concerned sectors.
- **Task 1.2:** Establish and approve a road map and timeline for the development of the D4 program, clarify roles and responsibilities across different stakeholders (Implementing Agency, Swiss and Indonesian polytechnics, private sector, national ministries, certification agency etc.).
- **Task 1.3:** Develop curricula for the participating polytechnics for D4 specialization programs based on a DACUM approach with the polytechnics and private sector companies, and facilitate their accreditation in collaboration with the Indonesian Ministry of Research and Technology and Higher Education and the National Professional Certification Authority (BNSP).
- **Task 1.4:** Define and support the procurement of the required equipment, testing procedures in laboratories, conduct trainings for instructors/lecturers in collaboration with the polytechnics and private sector companies.
- **Task 1.5:** Support the partner in the development of relevant teaching aids, preparation of program schedules, and the setting up of suitable internship programs in collaboration with the private sector.
- **Task 1.6:** Assess need for Training of Trainers (ToT) and conduct ToT with at least four instructors/lecturers per supported polytechnic.
- **Task 1.7:** Launch the D4 “post graduate” renewable energy programs at the participating polytechnics, monitor the D4 program implementation in cooperation with private sector and adjust the curricula where necessary in cooperation with private sector.

^[1] Develop A CURriculum (DACUM), provides a credible and defensible framework for developing job descriptions, identifying training needs, and prioritizing staff development initiatives)

- **Task 1.8:** Conduct a policy dialogue in collaboration with Swiss Embassy in Jakarta and other Indonesian SECO Skills Development projects and support the systemic introduction of DACUM as a tool for curriculum development, the use of D4 post-graduate degree programs as an approach for multidisciplinary learning, the definition of qualification standards at higher IQF levels, and the sustainability of financial support from the national ministries to supported polytechnics.

This also means that the Implementing Agency will be responsible for ensuring the availability and functionality of a monitoring systems collecting all relevant information to confirm the successful implementation of all above mentioned tasks and the achievement of the outcome. It is important to mention that it is not the Implementing Agency collecting these data, but the Implementing Agency has to show suitable Indonesian systems to do so, support the identification of a suitable Indonesian entity to collect the data and encourage its use and compile the data. Only in case that there are no Indonesian systems in place the Implementing Agency shall establish its own monitoring mechanisms.

3.1.2 Component 2 – Non-formal education

The main partners in this component are the PPSDM (Pusat Pengembangan Sumber Daya Manusia of EBTKE), the KEBTKE (Renewable Energy and Energy Conservation Department of MoEMR), and the BNSP (Badan Nasional Sertifikasi Profesi / Indonesia Professional Certification Authority).

Based on the D4 program developed in component 1, a series of modular, non-formal RE specialization training programs for hydro and solar are developed, introduced and implemented by PPSDM under the Human Resources Development Agency of MoEMR (through their two major training centers in Jakarta and Bandung), and scaled up by other public and private training providers across Indonesia. The project will support the Indonesian partners in the development of respective national standards at the IQF level 6-7, leading to recognized certification.

The outcome of the activities conducted under the component 2 shall be: “various training providers offer non-formal modular trainings in accordance with higher national skill standards providing skill and knowledge up-grading in Indonesia relevant to the RE labour market”. It is expected that by 2025 at least 5 training institutions (including at least 3 training institutions outside Java) provide non-formal training modules developed with the support of the project, 300 trainees have joined at least one module and 10 trainees graduated from all modules.

All relevant stakeholders (PPSDM, KEBTKE, BNSP, private sector) are expected to be involved. The Implementing Agency shall work closely with the Indonesian partners and their implementation units (UPT “unit pelaksanaan teknis”), and also with representatives from the private sector while conducting the work under this component. The Implementing Agency’s work includes, but is not limited to the following tasks:

- **Task 2.1:** Define/revise the learning outcomes and structure of modular short-term training for hydro and solar, based on the D4 specialization program. Clarify certification schemes with the Indonesia Professional Certification Authority (BNSP), the Ministry of Energy and Mineral Resources and the private sector.
- **Task 2.2:** Establish and approve a road map and timeline for the development of the modular short-term training, define clear roles and responsibilities across different stakeholders.

- **Task 2.3:** Develop the detailed content of the series of modular trainings in collaboration with the governmental training institution PPSDM and private sector companies, as well as BNSP.
- **Task 2.4:** Define necessary teaching aids and equipment and make it available through procurement, and define necessary training needs for instructors/lecturers at PPSDM on the new equipment.
- **Task 2.5:** Define trainer standards, assess training needs, conduct ToT for RE Module instructors, and conduct exams for trainers and provide certification (by PPSDM).
- **Task 2.6:** Introduce the new modular training programs at PPSDM and facilitate outreach to introduce the programs at additional public and private training providers (such as National Industrial Training Centres (BLKs), vocational high schools (SMKs), polytechnics, private training providers etc.).
- **Task 2.7:** Support and monitor the implementation of the modular program by Indonesian partners.
- **Task 2.8:** Monitor training results, report and implement required adjustments to the modules.
- **Task 2.9:** Develop national standards at the Indonesian Qualification Framework (IQF) level 6 to 7 and approved by the Professional Certification Authority (BNSP). Adjust training programs of component 1 and component 2 where necessary to ensure relevance and compliance with the standards in cooperation with the private sector.

This also means that the Implementing Agency will be responsible for ensuring the availability and functionality of a monitoring system collecting all relevant information to confirm the successful implementation of all above mentioned tasks and the achievement of the outcome. It is important to mention that it is not the Implementing Agency collecting these data, but the Implementing Agency has to show suitable Indonesian systems to do so, support the identification of a suitable Indonesian entity to collect the data and encourage its use and compile the data. Only in case that there are no Indonesian systems in place the Implementing Agency shall establish its own monitoring mechanisms.

3.1.3 Component 3 - Complementary activities

The main partners in this component are the KEBTKE (Renewable Energy and Energy Conservation Department of MoEMR), the BPSDM (Human Resources Development Agency of MoEMR), and the private sector and donor agencies interested in renewable energy promotion.

The third component shall foster knowledge and information exchange as well as awareness raising in the RE sector between various stakeholders. This component shall complement the training development and implementation by stimulating exchange and providing accurate data and information. One aspect will be the establishment (or further development) of a digital platform to support exchange of expertise, awareness building and guided communication between all stakeholders. All information on RE aspects shall be available or linked to one web page.

The component's aim is that "complementary activities have supported structures for cooperation between training providers and the private sector in RE, and promoted and supported a good reputation of RE technologies and availability of services".

The outcome of the activities conducted under the component 3 shall be: "exchange and understanding within the RE sector and with the education sector has led to a higher acceptance and use of RE".

All relevant stakeholder (KEBTKE, BPSDM, private sector) are expected to be involved. The Implementing Agency shall work closely with the Indonesian partners and their implementation units (UPT “unit pelaksanaan teknis”), and also with donor and private sector representatives while conducting the work under this component. The Implementing Agency’s work includes, but is not limited to the following tasks::

- **Task 3.1:** Link Indonesian and Swiss training institutions for peer-to-peer learning on tertiary education along the areas of work mentioned in chapter 3.1.6 (Tasks for the subcontracted Swiss Polytechnics)
- **Task 3.2:** Support the development and launch of a web-platform on the Indonesian RE sector (providing current information on policies, regulations, government institutions, training options, private sector companies, services, experts, etc.). Collaborate with the Indonesian Renewable Energy Society (METI – “Masyarakat Energi Terbarukan Indonesia”), and/or a suitable government or private entity, to ensure a sustainable hosting of the platform (English and Indonesian).
- **Task 3.3:** Support three Indonesian RE sector conferences (ideally on a yearly basis) to foster networking and knowledge-exchange among donors, government entities, private sector companies, national and international training institutions, certification bodies, etc. If possible, piggyback on the initiated “Renewable Energy Day” and introduce a new focus on skills, training opportunities and labor market development.
- **Task 3.4:** Support awareness campaigns for a wider introduction of RE technologies.

It is expected that three national RE conferences with participation of all main stakeholders and RE community have taken place, the public awareness of RE’s potential has improved, and customers find available RE services increasingly easy. In addition, the digitalisation of information shall help interested parties (including students) to learn about policies, regulations, technologies, best practice and the service delivery landscape. It will help to market training programs, match job seekers with potential employees and provide information about job openings.

3.1.4 Overall project management and coordination

The Implementing Agency has to ensure the coordination between the different components and to facilitate the cooperation of the different Indonesian project partners and stakeholders.

The Implementing Agency’s work includes, but is not limited to the following tasks::

- Revise and establish with the support of the Steering Committee and SCO Jakarta the Project’s detailed organisation with assignment of clear tasks and responsibilities of all involved parties, in accordance with the requirements of the Project and the technical and institutional assistance, and in accordance with Indonesian laws and regulations.
- Elaborate, with the support of other SECO projects, SCO Jakarta and the project partners, a “Project Implementation Manual (PIM, max. 25 pages)”: a document defining the operational functioning of the Project, including: procedures and rules for Project administration, handling of documents, quality control, contract supervision, testing, commission and hand-over. The rules and procedures for the selection of external consultants, suppliers or contractors according to Swiss procurement rules.
- Assist MoEMR and SECO in setting up at least annual Steering Committee meetings (SC meetings) and propose its future organisation based on the draft ProDoc.
- Prepare a General Project Implementation Plan (GIP), Yearly Plans of Implementation (YPO) with clearly defined milestones for the components and attribution of responsibilities among the different partners.

- Assure a permanent local presence in Indonesia over the duration of the Project implementation.
- Conduct coordination and interface management between all involved parties and Project components, and with other relevant SECO projects in Indonesia.
- Ensure that Project objectives are met in a sustainable way by monitoring the development of the Project and by proposing necessary steps for the sustainability to SCO Jakarta and the SC.
- Monitor and assess Project related risks and propose mitigation measures to SCO Jakarta and the Steering Committee.
- Maintain a proper budget and cost control system assuring compliance with SECO's financial management system. Regular external financial audits must be included in the budget.
- Verify / approve invoices of sub-contractors and partners in accordance with the payment procedure defined in the Project Agreement/PIM; review all guarantees submitted by sub-contractors and partners.
- By mid-term of the project, assist the Steering Committee in the writing of the ToR for an external Evaluation to assess the project performance. Ensure that conclusions and recommendations are used to steering.
- Depending on the outcomes of the mid-term evaluation and subject to a Steering Committee decision, start to develop a draft concept for option 1 / Phase II. Develop with the main partners a possible selection of the relevant additional renewable energy technology, suitable additional Polytechnics and training providers for the expansion. Assess the interest of Swiss polytechnics from Phase I to continue the collaboration and propose possible alternatives if necessary. Verify the interest and value added of Swiss technical associations or specialised Swiss companies in Indonesia for a collaboration in Phase II.

3.1.5 Reporting / Documents

The main reports and documents to be provided by the Implementing Agency include, but are not limited to:

- Prepare an Inception Report containing, but not limited to the following elements: detailed description of revised organisation, training needs, time schedule and revised budget as, revised LogFrame (incl. base line and target values). To be submitted three months after the project start and discussed with SCO Jakarta and the project partners.
- Prepare tender documents (based on SECO standard tender documents and Swiss procurement rules) for required laboratory equipment financed through the project funds (compare budget component 1 and 2 in chapter 6)
- Support the preparation of tender documents for laboratory equipment procured with Indonesian funding. Ensure compliance with procured equipment from project funds. Review partner tender evaluation reports with a focus on quality assurance. Prepare recommendations for tenders under this project to the Steering Committee.
- Prepare half-yearly progress reports containing activities, including formal and non-formal training activities concluded during the past six months, and planned activities during the upcoming period, cost overview, identified problems/difficulties and necessary correcting measures. Maximum pages: 15, excl. annexes. The reports shall be structured in accordance with the LogFrame.
- Once a year, ahead of the Steering Committee meeting, prepare an annual progress report, including an assessment of the context and the relevance of the intervention, as well as an assessment of the LogFrame reflecting the progress of the Project in relation to its

output and outcome indicators, and provide recommendations for change and steering in case needed.

- Once a year, ahead of the Steering Committee meeting, propose operations for the upcoming year and the corresponding financial allocations including financial resources provided by Indonesian partners.
- Establish a regular line of contact with the responsible person at the Swiss Cooperation Office / Swiss Embassy in Jakarta. Keep the person up-to date on activities and provide opportunity to get directly involved where appropriate to leverage Swiss interests and visibility.
- As a support for the SCO Jakarta, prepare the necessary information for the Steering Committee meeting, including: financial review, Project progress report based on the Log-Frame, if necessary a proposed updated LogFrame, overview of institutional activities, overview of promotion activities, updated Project time schedule, identified problems/difficulties and necessary correcting measures.
- Six months prior to the conclusion of Project and based on the external project evaluation report, the Implementing Agency shall prepare a report, which summarises and evaluates results, describes and appreciates the outcomes and indicates whether an upscaling or continuation of the Project makes sense. If not, propose the next steps, including direct phasing-out measures.
- Prepare a project completion report. The structure of this final report will be agreed between the Implementing Agency, SCO Jakarta and SECO Bern. A draft final report is to be submitted within 6 weeks prior to completion of works and will be discussed in Berne with SECO and in SCO Jakarta with the Steering Committee. The revised final report is expected two weeks after the consolidated feedback (4 weeks after submission of draft final report).

All reports and documents are to be provided in English language and in electronic form. In addition to the above, the Implementing Agency will prepare additional documents as required for the fulfilment of the mandate, e.g. training documents, manuals, minutes of meetings etc. Furthermore, the Implementing Agency will regularly inform verbally or by e-mail about important on-going issues.

3.1.6 Tasks for the subcontracted Swiss polytechnics

As mentioned above and in order to foster the exchange of experience and knowhow from Switzerland, a collaboration with Swiss Polytechnics will be a specific part of this project. Since the Swiss polytechnics are also mentioned explicitly in the Memorandum of Understanding between the Indonesian and the Swiss governments, their subcontracting is mandatory for the Implementing Agency. The Swiss polytechnics will be involved in the conceptualization (during inception phase) and implementation of the project in the following areas:

- Curricula-Development: Detailed development of job description, learning targets and competences, didactics, modalities for the involvement of the private sector; support the development of the content of curricula and selected modules, preparation of instruction material.
- Concept and equipment of laboratories in five polytechnics: assess status of the laboratories and needs for improvement, provide recommendations on equipment procurements, prepare instruction material for lessons in the laboratories.

- Training of Trainers: improve capacities of trainers to teach base on curricula and modules, improve didactic and technical skills.
- Research collaboration: promote research and master thesis in step with actual work and close to private sector demand, support collaboration between Switzerland and Indonesia (partly through in-kind contributions from the Swiss polytechnics)
- Service center approach for polytechnics: Enhance their connection with the private sector and develop products and services for the market.

The Swiss polytechnics will predominantly work from their offices in Switzerland. Approximately one third of the person days is expected to be implemented through missions to Indonesia in direct collaboration with the Indonesian polytechnics. Consequently, the Implementing Agency will have the overall responsibility on the above working areas in permanent exchange with the Indonesian partners and manage an efficient and effective involvement of the Swiss Polytechnics into these areas.

It is the Implementing Agencies responsibility to identify and propose qualified Swiss polytechnics with specific expertise in renewable energy training, didactics and pedagogical methods, and international cooperation. However, SECO has already reached out in 2019 to a larger number of polytechnic and invited them to express their interest for a collaboration. The following three polytechnics have expressed their interest and where invited to informal discussions with SECO: Interstaatliche Hochschule für Technik Buchs (NTB), Hochschule für Technik Rapperswil, Fachhochschule Nordwestschweiz FHNW. These polytechnics already had access to information on the general project concept and the feasibility study (Annex 2 of the Instructions to Bidders).

3.2 Option 1: Project Phase II

According to the feasibility-study, increasing labor marked demand in other renewable energy technologies can be expected in the coming years. Furthermore, there are around 20 additional polytechnics in Indonesia, which would be suitable to offer renewable energy post-graduate programs in the future, among them Ambon, Fakfak or Sorong. Finally, modular non-formal education can be offered in additional training institutions.

The possible option 1 is structured in the same way as the basic contract (Phase I). A mid-term evaluation in 2023 will help to take an informed decision on this option 1, further detail the scope of the interventions and submit a possible financing proposal to the responsible SECO hierarchy.

The main objectives of the Consultancy Services to be provided under option 1 can be summarised as follows, however, are not limited to the activities listed:

During the Inception phase:

- Maintain a functional Implementation Agency team.
- Keep technical work relationship with the Indonesian partners and the members of the Steering Committee.
- Review, finalize and optimize the basic design of Phase II, in close consultation with the Indonesian partners. Extend working agreements and adapt project communication concept with the main partners where necessary.
- Confirm and detail the project approach with the main partners and finalise the selection of the relevant new renewable energy technology, suitable additional Polytech-

nyics and training providers for the expansion. Come to agreement with Swiss polytechnics from Phase I or suitable alternatives to continue the collaboration. Decide on a possible integration of Swiss technical associations or specialised Swiss companies in Indonesia in the collaboration. On this basis, agree on a general project implementation plan (GIP) and a detailed yearly plan of operation.

- Review and confirm indicators to allow the Steering Committee to actively steer the Swiss and Indonesian inputs to the project and to take steering decisions at any point of the project implementation.
- Support the continuation of the Indonesian Implementation Coordination Committee with the responsibility for implementation coordination on the Indonesian side.
- Deliver final Project Document (Prodoc) for Phase II based on the mid-term evaluation of Phase I and the work conducted during the inception phase, including a revised LogFrame and respective budget.

Project implementation:

- Assist and monitor the Indonesian partners in the execution of their tasks. Manage and supervise in cooperation with the Indonesian Partners the successful implementation of the Project within the given timeframe, at the highest quality and within the budgetary limits.
- Enhance operational, financial and managerial capacity at Ministry, Polytechnic and training centre level.
- Support the development and successful implementation of a formal renewable energy specialisation program in close cooperation with Polytechnics and the private sector.
- Support the development and successful implementation of a series of modular, non-formal renewable energy specialization training programs.
- Ensure the active involvement of the private sector in all relevant tasks.
- Foster the exchange of experience and knowhow from Switzerland through the collaboration with the selected Swiss polytechnics, and potentially Swiss technical associations or specialised Swiss companies in Indonesia.
- Foster knowledge and information exchange as well as awareness raising in the renewable energy sector between various stakeholders.

The following sub-chapters will provide some additional information on the tasks the Implementing Agency will have to perform during the implementation of option 1 (Phase II). The scope of the services of the Implementation Agency will include, but not be limited to, the tasks described in the following sections.

3.2.1 Component 1 - Formal education

This component shall develop an additional D4 level RE specialisation programs (for electrical, mechanical and civil engineering graduates) for an additional renewable energy technology in the five Indonesian polytechnics from phase 1. In addition, the existing D4 level RE specialisation programs for hydro and solar should be brought to implementation at five additional polytechnics. All relevant stakeholders, including government agencies and private companies are expected to be involved.

The Implementing Agency's work includes, but is not limited to the following tasks:

- **Task 1.1:** Develop a one year “post graduate” D4 program specialized in the selected additional renewable energy technology in line with the procedure conducted in component 1 of the basic contract (including DACUM approach, laboratory upgrades teaching aids development, internship programs set up, Training of Trainers (ToT), implementation support and ex-post adjustments to curricula). Support implementation of this new program in the five polytechnics from phase 1.
- **Task 1.2:** Introduce the existing “post graduate” D4 program on hydro and solar / solar-hybrid in five additional polytechnics and support the implementation according to the procedure in component 1 of the basic contract.
- **Task 1.3:** Continue to monitor the implementation of phase 1 programs and support necessary improvement in collaboration with the polytechnics and other project partners.

3.2.2 Component 2 – Non-formal education

This component shall develop a series of modular, non-formal RE specialization training programs for one additional renewable energy technology based on new D4 program developed in component 1 of Phase II. It will then be implemented by PPSDM under the Human Resources Development Agency of MoEMR (through their two major training centers in Jakarta and Bandung). This new modular, non-formal RE specialization training programs as well as the ones developed under phase I of the project will be introduced to at least five other public and private training providers across Indonesia.

The Implementing Agency’s work includes, but is not limited to the following tasks:

- **Task 2.1:** Develop modular short-term trainings for for one additional renewable energy technology, in line with the procedure applied in component 1 of the basic contract (including clarification of certification schemes, development of detailed content, definition of necessary teaching aids and equipment, definition and implementation of ToT for RE Module instructors, development of national standards at the Indonesian Qualification Framework (IQF) level 6 to 7).
- **Task 2.2:** Introduce the new modular training programs at PPSDM. Facilitate outreach of the new modular training programs as well as the ones developed under phase I to at least five additional public and private training providers.
- **Task 2.3:** Continue to monitor the implementation of phase 1 modular programs and support necessary improvement in collaboration with the training institutions and other project partners.

3.2.3 Component 3 – Continuation of complementary activities

The third component shall continue to foster knowledge and information exchange as well as awareness raising in the RE sector between various stakeholders. This component shall complement the development and implementation of the trainings by stimulating exchange and providing accurate data and information. The Implementing Agency shall continue to work closely with the Indonesian partners and their implementation units (UPT “unit pelaksanaan teknis”), and also with donor and private sector representatives while conducting the work under this component. The Implementing Agency’s work includes, but is not limited to the following tasks::

- **Task 3.1:** Link Swiss training institutions to additional Indonesian polytechnics and training institutions for peer-to-peer learning on tertiary education along the areas of work mentioned in chapter 3.2.6 (Tasks for the subcontracted Swiss Polytechnics)

- **Task 3.2:** Continue to support the sustainable hosting of the web-platform on the Indonesian RE sector (English and Indonesian) in the long run. Ensure the provision of up to date information on training opportunities through the partner institutions of the project.
- **Task 3.3:** Support Indonesian RE sector conferences and foster discussions on vocational education and training opportunities.
- **Task 3.4:** Continue to support awareness campaigns for a wider introduction of RE technologies.

3.2.4 Overall project management and coordination

The Implementing Agency has to ensure the coordination between the different components and to facilitate the cooperation of the different Indonesian project partners and stakeholders.

The Implementing Agency's work includes, but is not limited to the following tasks:

- Revise the project's detailed organisational structure from Phase I where necessary and reassign clear tasks and responsibilities of all involved parties for Phase II.
- Revise the "Project Implementation Manual" and the Log Frame where necessary for Phase II.
- Continue to assist MoEMR and SECO with the preparation of the Steering Committee meetings (at least annually).
- Prepare a General Project Implementation Plan (GIP), Yearly Plans of Implementation (YPO) with clearly defined milestones for the components and attribution of responsibilities among the different partners.
- Assure a permanent local presence in Indonesia over the duration of the implementation of option 1.
- Continue to conduct coordination and interface management between all involved parties and Project components, and with other relevant SECO projects in Indonesia.
- Ensure that Project objectives are met in a sustainable way by monitoring the development of the Project and by proposing necessary steps for the sustainability to SCO Jakarta and the Steering Committee.
- Monitor and assess Project related risks and propose mitigation measures to SCO Jakarta and the Steering Committee.
- Maintain a proper budget and cost control system assuring compliance with SECO's financial management system. Regular external financial audits must be included in the budget.
- Verify / approve invoices of sub-contractors and partners in accordance with the payment procedure defined in the Project Agreement/PIM; review all guarantees submitted by sub-contractors and partners.
- By mid-term or end of the project, assist the Steering Committee in the writing of the ToR for an external Evaluation to assess the project performance.

3.2.5 Reporting / Documents

Requirements include, but are not limited to the same main reports and documents to be provided by the Implementing Agency as in Phase I of the contract described in chapter 3.1.5.

3.2.6 Tasks for the subcontracted Swiss polytechnics

In phase II of the project, the Implementing Agency is expected to continue involving Swiss polytechnics in the conceptualization (during inception phase) and implementation of the project in the same areas of work as in Phase I of the project (curricula-development, concept

and equipment of laboratories, Training of Trainers, research collaboration and service center approach for polytechnics). At the beginning of Phase II, the Implementing Agency shall assess the interest of Swiss polytechnics from Phase I to continue the collaboration and propose alternatives if necessary.

The Swiss polytechnics will be subcontracted by the Implementing Agency, which will have the overall responsibility on the above working areas in permanent exchange with the Indonesian partners.

4 Time schedule

The project implementation is expected to start in Q4 2020⁵ and is expected to be completed within 4.5 years after the signing of the contract. However, the bidders are invited to propose a schedule according to their experience and approach. Activities shall start as soon as the contract with the Implementation Agency enters into force.

The implementation of option 1 is expected to take place in a timeframe of 3.5 years, about between Q2 2025 and Q4 2028.

5 Required qualifications

The call for tenders is open to qualified consulting firms. The Implementing Agency participating in the tender are invited to define the staff needs and task assignments according to their own experience and methodology. The Implementation Agency's team for the implementation of the basic contract as well as option 1 should at least comprise the following experts and expertise.

- **A Project Manager** evidence of experience in the implementation of projects comparable with the present mandate in terms of scope and complexity. At least 10 years of experience in the field of vocational training and education, including experience in the South East Asian context and in Indonesia. Knowledge of and experience in the collaboration with polytechnics, ideally in the field of energy. Experience in collaboration with national authorities and the development / approval of national policies and guidelines. Knowledge of the Swiss dual education systems and its relevant stakeholders. Knowledge in Bahasa Indonesia is an asset.
- **An internationally experienced renewable energy expert.** Experience in the conceptualization, installation, operation and maintenance of renewable energy technology. Know-how of the private and public market and the current demand for skills in the sector. Strong management skills and proven experience in managing participatory processes.
- An adequate number of **local experts** for the direct collaboration with the five polytechnics and various Indonesian counterparts at national level. They should provide experience in skills development projects and renewable energy programs. The local experts should have good knowledge of the local, regional and national decision-making processes concerning vocational education, energy policy, and the development of the renewable energy market. Given the relatively complex governance structure, they need experience with the involvement of different stakeholders in project

⁵ Providing a normalization in the development of the global COVID-19 pandemic and the possibility for face-to-face meetings with key partners in Indonesia, as well as travel from, to and within Indonesia.

implementation. Good knowledge in English language is required to assure an efficient knowledge transfer between all parties involved.

- An adequate number of **local office support staff**, responsible for accounting, logistics and communication.

The overall team should have the following competences and experience:

Technical competences and experience

- Strong experience in the field of vocational training and education, the development of formal and non-formal education programs at tertiary level, ideally in Indonesia.
- Strong knowledge on renewable energy technology, in particular solar (-hybrid) and hydro.
- Relevant experience and expertise in public awareness raising campaigns and knowledge exchange
- Project management skills, experience in monitoring, controlling and evaluation tasks (incl. logframe)
- Language skills: The command of English language among the whole team is key to assure knowledge transfer and a proper Project implementation. Bahasa is mandatory for the local experts and an asset for the project manager / international consultant.

Methodological competences and experience

- Experience in didactics for practical and multidisciplinary trainings and education;
- Strong expertise in capacity building of institutions and individuals / trainers;
- Relevant experience and expertise in the development / supporting the approval of vocational education policy framework conditions;
- Strong expertise in methodologies and approach to involve private sector partners into vocational education;

Context knowledge and experience

- Strong knowledge of Indonesian (and South East Asian) context and in particular in the vocational education and local energy sector. Expertise in the current skills demand in the South East Asian / Indonesian renewable energy market. Management of similar projects in skills development / in Indonesia is an asset;
- Knowhow of the Swiss approach on dual education and vocational training, experience of know-how transfer from Switzerland to other countries an asset;
- Experience with local, regional and national decision making processes concerning vocational education and energy policy;

The Implementation agency shall establish the optimal internal organizational structure that ensures a solid and efficient implementation of the Project. The minimal structure, mentioned above and in the instructions to bidders should however be taken into consideration and critically assessed (One Project manager and one internationally experienced expert, local expert staff, office support staff).

6 Procurement and available budget

The available Swiss contribution for the implementation of the basic contract is CHF 6.5 m, while option 1 has a volume of an additional CHF 4.7 m. The implementation agency for the basic contract including option 1 will be procured by SECO through an open competitive bidding according to Swiss procurement law (BöB/VöB, chapter 3). The procurement will be

done in close consultation with the Human Resources Development Agency of the Ministry of Energy and Mineral Resources of Indonesia BPSDM. SECO will sign the contract with the implementation agency. However, only Phase I is considered as basic contract in this tender and will be activated automatically by virtue of this tender. SECO is not obliged to fully or partially contract the optional services to the Implementing Agency. In case of non-activation of option 1, the Consultant is not entitled for any kind of compensation. The activation of Option 1, is indicated in writing by SECO at least three months before purchase. It depends, among others, on the results of Phase I and the performance of the implementation Consultant, and is subject to SECO's authority approval for the necessary funding.

Besides the Swiss contribution, the government of Indonesia and the five participating polytechnics are responsible to provide free and transparent access to available data and information for the Implementing Agency. For the basic contract, they will also provide in-kind contributions for personal that are equivalent to 29 person-years of project management staff and teachers amounting to estimated CHF 350'000. In addition, counterpart funding for repair and adjustments of existing laboratories and procurement of new equipment will amount to estimated CHF 2.1 m. Upcoming investments into the construction of the new polytechnic in Bali are not calculated into this amount. Comparable in-kind contributions for personal and equipment will be expected to the implementation of the possible phase II.

The previous, is an example of collaboration and cooperation that is expected from the national administration and the polytechnics and will be contained within the bilateral project agreement that BPSDM will sign with SECO.

The tenders for any needed equipment financed through project funds shall be prepared and executed by the Implementing Agency, in close consultation with the polytechnics. SECO will have non-objection rights for procurements above CHF 50'000. Swiss Procurement rules will apply and SECO standard documents shall be used.

Budget

The table below shows an indicative allocation of the budget. The Implementing Agency is free to suggest a different allocation, according to his offer, methodology and experience. The only amounts that should remain unchanged are marked with an asterisk: Subcontracting to Swiss Polytechnics and Project Evaluation

Budget items	CHF in thousand
Basic contract	6500
Staff costs (including housing and home leaves)	2100
Subcontracting to Swiss Polytechnics	700*
Project administration	500
Activities component 1 (including a budget of CHF 400k for laboratory equipment)	950
Activities component 2 (including a budget of CHF 200k for laboratory equipment)	700
Activities component 3	550
Independent Evaluation	50*

Overhead / Reserve	950
Option 1 (Phase II)	4700
Staff costs (including housing and home leaves)	1540
Subcontracting to Swiss Polytechnics	500*
Project administration	370
Activities component 1 (including a budget of CHF 330k for laboratory equipment)	700
Activities component 2 (including a budget of CHF 150k for laboratory equipment)	510
Activities component 3	330
Independent Evaluation	50*
Overhead / Reserve	700

7 Support documentation

More detailed information about the Project is available in the feasibility Study (see attachment 2 of the Instructions to bidders). Please note that this study is for background information, the tasks of the basic contract and option 1 are described in the present ToR. In case of contradiction between the TOR and the feasibility study, the TOR shall prevail.

8 Annexes

Annex 1: *Logframe Phase I*



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER

State Secretariat for Economic Affairs SECO
Economic Cooperation and Development
Infrastructure Financing

Energy Access through Skills Development Project (RESO)	Indonesia / South East Asia	
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Strategy of Intervention	Key Performance Indicators Implementing Partner	Key Performance Indicators Indonesian Partners	Means of Verification	External Factors (assumptions)
Impact	Impact Indicators			
- Renewable Energy plans are better designed, planned, installation, operated and maintained	-	- Number of graduates who find adequate jobs in the RE sector on the local labor market - Domestic and international investors find the required labour force on the Indonesian labour market	- Survey and questionnaires of graduates	- The ambitious RE targets are sufficiently supported by the national government and investments are procured in the respective timeframe
Outcomes	Outcome Indicators*			
- Outcome 1: Formal, multi-disciplinary RE specialisation programs at D4 level are in place and produce labour market relevant graduates for the RE sector.	-	- At least three Polytechnics in eastern Indonesia are offering D4 "post graduate" studies for D3 graduates from different engineering background and enroll 30 trainees per program and year by 2023	- Project reporting	- Selected polytechnics show continuous interest in the development of a D4 program - Civil, technical and mechanical engineers show interest in a

State Secretariat for Economic Affairs SECO
Roman Windisch
Holzikofenweg 36, 3003 Bern
Tel. +41 58 469 78 24, Fax +41 58 463 18 94
roman.windisch@seco.admin.ch
www.seco.admin.ch

Strategy of Intervention	Key Performance Indicators Implementing Partner	Key Performance Indicators Indonesian Partners	Means of Verification	External Factors (assumptions)
		<ul style="list-style-type: none"> - Number of graduates from D4 specialisation programs is increasing in accordance with RE sector growth - Curricula of offered D4 RE programs are regularly updated in cooperation with the private sector - 20% of lessons taught in the D4 programs are conducted by guest experts from private sector - The number of D3 graduates studying in multidisciplinary D4 “post graduate studies” has been increasing - Standard Indicator#3: Measures for improving capacity development - Standard Indicator #10: Number of persons/entities undergoing training or continuing education (entrepreneurs, producers, staff) 		specialization program at D4 level
- Outcome 2: Different training provider offer non-formal modular trainings in accordance with higher national skill standards providing skill and knowledge up-	- Modular training series for hydro and solar (including hybrid systems) with same level of qualification as D4 “post graduate” program developed	<ul style="list-style-type: none"> - Modular trainings have produced at least 20 graduates at IQF level 6 – 8 - Standard Indicator #3: Measures for improving capacity development 	- Project reporting through monitoring activities of BPSDM / international consultant	- Training providers in the non-formal sector are interested to offer the modular trainings in their institutions

Strategy of Intervention	Key Performance Indicators Implementing Partner	Key Performance Indicators Indonesian Partners	Means of Verification	External Factors (assumptions)
grading in eastern Indonesia relevant to the RE labour market.	<ul style="list-style-type: none"> - Training program and materials free of charge available on the internet 	<ul style="list-style-type: none"> - Private sector is recognising certification as entry level for supervisor operation and maintenance - At least 5 graduates are engaged in training provision - Standard Indicator #10: Number of persons/entities undergoing training or continuing education (entrepreneurs, producers, staff) 		<ul style="list-style-type: none"> - People on the job are interested in further education through specialization modules in the RE sector
<ul style="list-style-type: none"> - Outcome 3: Exchange and understanding within the RE sector and with the education sector has led to a higher acceptance and use of RE. 	<ul style="list-style-type: none"> - No. of activities taking place not initiated by the project - No. of vertical twinning agreement - No. of international horizontal twinning 	<ul style="list-style-type: none"> - Stakeholders take ownership of activities - Exchange platforms managed by stakeholders 	<ul style="list-style-type: none"> - Project reporting through monitoring activities of BPSPDM / international consultant 	<ul style="list-style-type: none"> - Actors in the energy sector show interest in Renewable energy and access information - Associations and RE private sector is interested to continue activities of knowledge sharing
Outputs	Output Indicators			
<ul style="list-style-type: none"> - Output 1.1: Learning outcomes, structure and pre-conditions for a one year “post graduate” D4 program specialised in solar, solar hybrid and hydro RE production defined 	<ul style="list-style-type: none"> - Detailed labour market assessment is conducted - DACUM workshop with private sector and Polys have been conducted for solar (including hybrid) and hydro - DACUM results are shared and discussed with the private sector and Polys 	<ul style="list-style-type: none"> - Proposal for the inclusion of new RE D4 specialisation studies are prepared and submitted - D4 “studi lanjut” on solar (including hybrid) and hydro, for graduates from different engineering fields, have been included in the 	<ul style="list-style-type: none"> - Project reporting 	<ul style="list-style-type: none"> -

Strategy of Intervention	Key Performance Indicators Implementing Partner	Key Performance Indicators Indonesian Partners	Means of Verification	External Factors (assumptions)
		"Daftar Program Studi Perguruan Tinggi"		
- Output 1.2: Road-map for the development, and clarifying of roles and responsibilities established and approved	<ul style="list-style-type: none"> - Draft road-map developed - Road-map discussed with main partners (Polys, BPSDM) - Final road-map presented to steering committee 	<ul style="list-style-type: none"> - Legal and regulatory inputs to road-map provided (regulations, procedures) - Signature on final road-map proposal 	- Project reporting	-
- Output 1.3: Curricula for at least two D4 specialisation programs developed and accredited	<ul style="list-style-type: none"> - DACUM workshop with private sector and Polys have been conducted for solar (including hybrid) and hydro - DACUM results are shared and discussed with the private sector and Polys - Curricula sharing WS with private sector organised and conducted and results followed-up defined 	<ul style="list-style-type: none"> - Two draft D4 curricula on specialisation on solar (including hybrid systems) and hydro ready to be discussed - Curricula adjustments based on discussions with private sector done - Formal curricula accreditation process launched and followed-up 	- Project reporting	-
- Output 1.4: Required equipment, testing procedures (testing facilities) and training for instructors/lecturers defined and available	<ul style="list-style-type: none"> - Listing and specification of required training equipment provided - Training equipment purchased with project budget identified, purchased, handed over and trainers trained 	<ul style="list-style-type: none"> - Equipment required (but not provided by RESD project) is included to be purchased by regular school budget or provided by MoEMR - Procurement of equipment with consent of RESD expert, delivery with handing over, test run and training of trainers 	- Project reporting	-

Strategy of Intervention	Key Performance Indicators Implementing Partner	Key Performance Indicators Indonesian Partners	Means of Verification	External Factors (assumptions)
- Output 1.5: Teaching aids and internship programs developed	<ul style="list-style-type: none"> - Teaching aids developed and introduced to partner - Internship model presented and agreed by partner - Learning outcomes for internships defined 	<ul style="list-style-type: none"> - Internship model adopted - Private sector partner informed and placement of students organised 	- Project reporting	- Private sector cooperates on the development of internship programs
- Output 1.6: ToT with at least 4 instructors/lecturers per institution conducted and participants certified	<ul style="list-style-type: none"> - Training of trainers elaborated and at least two trainings with support of international expert implemented - Exam for trainers developed and conducted, trainers certified by the project (or int. partner institution) 	<ul style="list-style-type: none"> - Each Poly provided budget and time for at least three trainers to participate in ToT - Trainers trained are assigned to teach the new D4 program 	- Project reporting	- Trainers are motivated to increase their capacity in RE teaching and training
- Output 1.7: D4 “post graduate” RE programs launched at participating polytechnics	- Program introduction process monitored	<ul style="list-style-type: none"> - Enrolment process for RE programs launched - 2021 at least 20 D4 RE students per poly and program enrolled - Number of students for first 3 years limited 	- Project reporting	-
- Output 1.8: Program implementation monitored in co-operation with private sector	<ul style="list-style-type: none"> - Program implementation monitored - Regular assessment briefings with private sector partners 	<ul style="list-style-type: none"> - Monitoring system introduced - Data collected and distributed - 2022 and beyond at least 20 graduates placed in RE sector 	- Project reporting	-

Strategy of Intervention	Key Performance Indicators Implementing Partner	Key Performance Indicators Indonesian Partners	Means of Verification	External Factors (assumptions)
- Output 2.1: Learning outcomes, structure and pre-conditions for modular short-term training based on D4 specialisation program defined	<ul style="list-style-type: none"> - Modular training based on D4 "post graduate" program is structured - Certification scheme is clarified (in cooperation with BNSP, LSP BPSDM and Private Sector) 	<ul style="list-style-type: none"> - Development of modular training by local experts - Modular training is included in training portfolio - Certification scheme processed by LSP BPSDM for BNSP accreditation 	- Project reporting	-
- Output 2.2: Road-map for the development, clear roles and responsibilities are established and approved	<ul style="list-style-type: none"> - Draft road-map developed - Road-map discussed with main partners - Final road-map presented to steering committee 	<ul style="list-style-type: none"> - Legal and regulatory inputs to road-map provided (regulations, procedures) - Signature on final road-map proposal 	- Project reporting	-
- Output 2.3: Series of modular trainings developed	<ul style="list-style-type: none"> - Structure of modular training defined and discussed with partner - Regular/planned exchange with development team of PPSDM conducted and recorded 	<ul style="list-style-type: none"> - Development of modular training by local experts 	- Project reporting	-
- Output 2.4: Teaching aids developed and required equipment and training for instructors/lecturers defined (D4 adjusted)	<ul style="list-style-type: none"> - Teaching aids developed and introduced to partner - Listing and specification of required training equipment provided - Training equipment purchased with project budget identified, purchased, and handed over - Training of trainers implemented and assessed 	<ul style="list-style-type: none"> - Equipment required (but not provided by RESD project) is included to be purchased by regular budget or provided by MoEMR - Procurement of equipment with consent of RESD expert, delivery with handing over, test run and training of trainers - Teaching aids tested and approved 	- Project reporting	-

Strategy of Intervention	Key Performance Indicators Implementing Partner	Key Performance Indicators Indonesian Partners	Means of Verification	External Factors (assumptions)
- Output 2.5: Needs for ToT assessed and training to fill gaps conducted and trainer certified	<ul style="list-style-type: none"> - Trainer standards clarified and training of trainers elaborated and at least two trainings with support of international expert supported - Exam for trainers developed and conducted, trainers certified by the project (or int. partner institution) - Potential training institutions identified (e.g. BLK) 	<ul style="list-style-type: none"> - At least two ToT trial conducted and 20 trainers from other institutions (e.g. BLK) trained - At least 5 institutions are supported to introduce modular training for RE experts - Certification of trainees created 	- Project reporting	- Trainers that are motivated to increase their capacity in RE teaching and training can be identified
- Output 2.6: New modular training programs introduced at public and private training provider	- Program introduction process monitored	- Enrolment process for RE programs launched at 5 training providers and PPSPDM	- Project reporting	- Training institutions outside the government partner PPSPDM are interested in offering the modular trainings
- Output 2.7: Program implementation monitored by Indonesian partner in cooperation with private sector	<ul style="list-style-type: none"> - Program implementation monitored - Regular assessment briefings with private sector partners 	<ul style="list-style-type: none"> - Monitoring system introduced - Data from other training providers collected and disseminated 	- Project reporting	-
- Output 2.8: Training results and required adjustments assessed and reported	<ul style="list-style-type: none"> - Training outcome assessed - Corrective measures elaborated (in case needed) - Results reported to steering committee 	<ul style="list-style-type: none"> - Training data collected - At least a total of 300 trainees participated in a modular training - 10 trainees join the whole training series and achieved IQF level 7 	- Project reporting	-
- Output 2.9: National standards (IQF level 6 to 8) developed and approved and	- Process of developing national standards IQF 6 – 8	- Working committee appointed and clear task description provided	- Project reporting	- Professional Certification Authority (BNSP) supports

Strategy of Intervention	Key Performance Indicators Implementing Partner	Key Performance Indicators Indonesian Partners	Means of Verification	External Factors (assumptions)
training programs of component 1 and component 2 adjusted if required	for the RE sector is facilitated	<ul style="list-style-type: none"> - National standards for RE specialists and experts (IQF level 6 – 8) developed and proposed - National standards approved - Training programs adjusted to reach appropriate level of expertise 		the development of national standards and provides approval
<ul style="list-style-type: none"> - Output 3.1: Web-platform on Indonesian RE sector (technologies, policies, regulations, government institutions, training options, private sector companies, services, experts, etc.) established and launched 	<ul style="list-style-type: none"> - Assess available platforms and propose cooperation approach - RE platform containing general information, specific information for different RE technologies, Indonesian regulations, Indonesian institutions, training provider, training programs on offer, association, private service providers, etc. is operational - Use of platform is monitored, increasing use 	<ul style="list-style-type: none"> - Relevant government agencies provide link on RE platform - MoEC and MoEMR promote platform with official letter - At least 100 private sector companies provide data to the RE data base 	<ul style="list-style-type: none"> - Project reporting 	<ul style="list-style-type: none"> - Host for long-term operation of the platform can be identified
<ul style="list-style-type: none"> - Output 3.2: Awareness campaigns for wider introduction of RE technologies supported with expertise 	<ul style="list-style-type: none"> - Criteria for RESD project support to awareness raising developed and approved by SECO - Indonesian initiatives to promote use of RE technology supported and impact assessed 	<ul style="list-style-type: none"> - No of proposals activities to promote RE technology - Documentation, press clipping on RE promotional activities - 4 scholarships provided at each Poly involved 	<ul style="list-style-type: none"> - Project reporting 	-

Strategy of Intervention	Key Performance Indicators Implementing Partner	Key Performance Indicators Indonesian Partners	Means of Verification	External Factors (assumptions)
	<ul style="list-style-type: none"> - Scholarship program for D4 “post graduate” RE developed, and 4 student fees provided 			
<ul style="list-style-type: none"> - Output 3.3: Three yearly Indonesian RE sector conferences organised and conducted (donors, government, private sector, national and international training institutions, certification bodies, etc.) 	<ul style="list-style-type: none"> - Draft road-map developed and 50% budget sponsoring secured - Road-map discussed with main partners and approved by steering committee - Conferences implemented and public and policy reactions monitored 	<ul style="list-style-type: none"> - Legal and regulatory inputs to road-map provided (regulations, procedures) - Signature on final road-map proposal - Conference budget sponsored by at least 50% 	<ul style="list-style-type: none"> - Project reporting 	-
<ul style="list-style-type: none"> - Output 3.4: National and international training institutions linked 	<ul style="list-style-type: none"> - Cooperation between project partners and international training institutions promoted - At least two international expert missions per year to Indonesia organised - ToR for international expert missions 	<ul style="list-style-type: none"> - 4 request for int. Expert support per year - Active participation/organisation in/of Expert missions 	<ul style="list-style-type: none"> - Project reporting 	-