ENERGY TRANSITION PARTNERSHIP

IIEE
Indonesian Institute for Energy Economics

ENERGY EFFICIENCY AND ENERGY CONSERVATION AWARENESS RAISING IN THE EDUCATION SECTOR, INCLUDING AN ENERGY SAVING COMPETITION

GRANT REF.: ETP-CFP-VIP2-08/2021

Executive Summary

2022

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"Energy Efficiency and Energy Conservation Awareness Raising in the Education Sector, Including An Energy Saving Competition in East Java Province"

1. BACKGROUND

Problem Statement

Global energy consumption has risen significantly over the last sixty years since the Industrial Revolution. In the 1960's the global primary energy consumption reached 43,301 TWh, with coal and fossil fuel as the main source of energy. In the 1990's, the consumption had reached 101,049 TWh, with unaltered source of energy. This means, in the span of 30 years, the global primary energy consumption had increased by 51,749 TWh or more than 30 billion BOE. This escalation is also directly proportional to the production of CO_2 emissions which consequently raising the global average temperature. This effect can be seen from the global temperature anomaly difference between 1968 and 2021 which is -0.08°C and 0.85°C respectively.

In 2015, 197 countries signed the Paris Agreement, which legally binds international treaty on climate change, adopted by 196 Parties at COP 21 in Paris on 12 December 2015 and entered into force on 4 November 2016. The goal is to limit global temperature rise well below 2°C, preferably to 1.5°C, compared to pre-industry levels. Indonesia has committed to reduce greenhouse gas (GHG) emission reduction by 29% through self-effort and up to 41% with international assistance. With this commitment, demand-side energy efficiency and conservation (EEC) would serve as a lower cost and shorter-term solution than the supply-side EEC. The National General Energy Plan (RUEN) has targeted 17% and 39% efficiency in 2025 and 2050 from the total energy demand compared with the business-as-usual scenario. EEC would also reduce environmental impact (pollution and greenhouse gas emission from fossil fuel burning) and increase national energy self-sufficiency due to fuel import reduction.

In 2020-2030 Indonesia will have a massive demographic bonus. Systematic efforts should be prepared the future productive-age generation to support the demand-side EEC action. Collaborating with UNOPS intention, the proposed project will raise the younger generation's awareness on energy efficiency and conservation and will build their energy conservation behavior. Education sector or school institution, as a representative of younger generation, is chosen as the project's main beneficiary.

The Program

"Good habits formed at youth make all the difference." - Aristotle

With this in mind, UN has initiated a habit-forming program in schools to raise awareness of energy efficiency. With the increasing awareness of energy efficiency and conservation (EEC), we are challenged to come with initiatives and innovation to serve as a lower cost and shorter-term solution than the supply-side EEC. The National General Energy Plan (RUEN) has targeted 17% and 39% efficiency in 2025 and 2050 from the total energy demand compared with the business-as-

usual scenario. EEC would also reduce environmental impact (pollution and greenhouse gas emission from fossil fuel burning) and increase national energy self-sufficiency due to fuel import reduction. This will contribute to Indonesia's commitment to greenhouse gas emission reduction as ratified by Indonesia in the Paris Agreement.

Objectives

The primary objective of this program is to contribute to the reduction in energy consumption in schools and homes. Through this program, students will be assisted to learn about energy savings and efficiency and the implementation on their surroundings.

The specific objectives of this program are:

(i) students learned where electricity comes from, how it is made and how it impacts the environment to increase their awareness and capacity about energy efficiency in the selected schools in East Java,

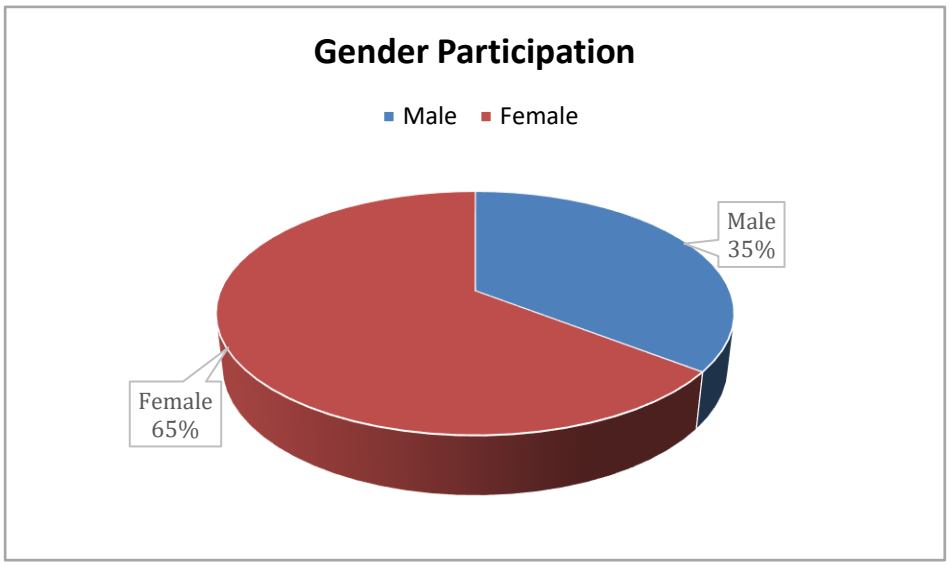
(ii) students learned how they can save energy in their everyday life, at school and at home to encourage energy savings behavior changes,

(iii) students, teacher, and schools implemented what they are taught in the energy efficiency programs and activities to their everyday life by designing bottom-up energy-saving policies.

2. GENDER

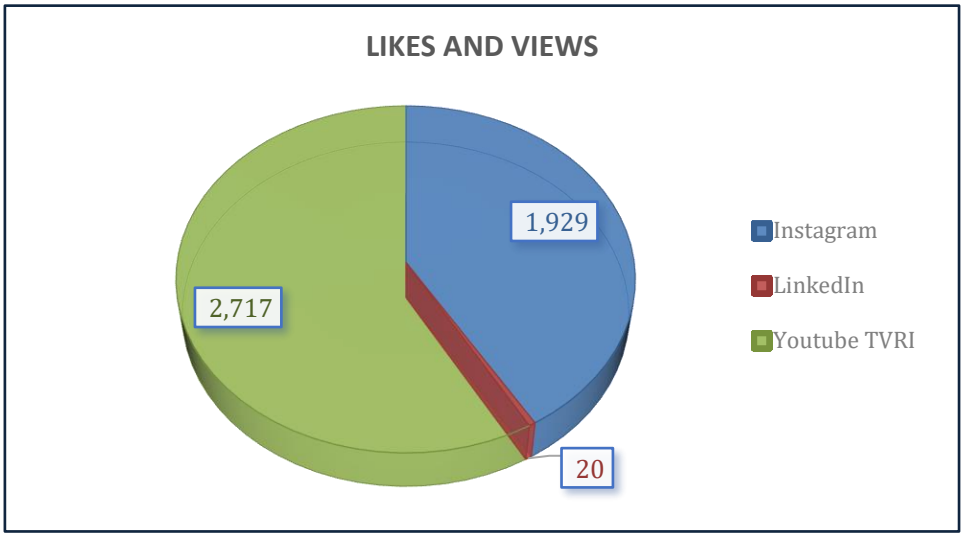
To assess gender participation and achievement, the model used in this section was by assessing the involvement of male and female teachers and students in all activities, from training, monitoring and evaluation, judging to program closing, in terms of attendance on each activity.

The total participation throughout the program is shown in the following figure. Respectively, there were 609 female and 335 male participants attended during all activities.



3. PUBLICATION AND COMMUNICATION

Publication and communication activities are quite effective promotional and broadcasting tools. This program also used several media for publication and communication, and it was hoped that this program could be a lesson and be known by the public. The media used include Instagram, Website, YouTube, LinkedIn, Newsletter/e-news and Television.



For some articles published on Instagram, YouTube, and LinkedIn, it could be seen that the program was liked quite a lot. The broadcast of this program through the official Instagram of the Ministry of Energy and Mineral Resources which has posted 3 articles had a total of 1,754 likes, the official Instagram of the Directorate General of EBTKE had a total of 77 likes, and the official Instagram of IIEE had a total of 98 likes. Other than these social media portals, the program had been covered as well through several newsletters such as the NAWALA Bimasena and E-News ETP-UNOPS. In addition, the participating schools also had their own Instagram and TikTok account that spread quite a lot of news about the program.

4. SOCIAL AND ENVIRONMENTAL ASSESSMENT

Social Assessment

There are two groups of community that were directly targeted for impact in this project:

1. School

The school community was benefiting from increased awareness of the importance of energy-saving behaviors that contributed to the global energy transition efforts. The current diversity of school economic and social backgrounds was also thought to affect the success of the program in each school.

2. Household

Each of the Energy Saving Ambassadors' household was also the target of impact in this project. Here, each Energy Saving Ambassador acted as the person responsible for practicing and promoting the energy-saving behavior in each of their household, even to extended families and the surrounding environment.

Environmental Assessment

This project would contribute to the environment through the reduction/avoided of potential CO_2 emissions. The Energy Managers as well as the Energy Saving Ambassadors had been assigned to document their daily and monthly electricity consumption at school and at their homes. The documented electricity consumption was used as the basis to track their progress in electricity saving and further the avoided CO_2 emission. This process had been started since the first training session and keep progressing until the Monev phase and Competition Judging Day.

5. LESSONS AND TAKEAWAYS

School Selection Criteria

The school selection was made under the authority of the Provincial and District Education, based on the requested criteria, which was to select the unpopular schools. As this program/training had been completed, it was finally concluded that the criteria should be made clearer and in detail based on prior analysis upon the required uniformity of initial condition of participants. For example, schools that had participated in the Adiwiyata program (environmentally friendly school program) would have different levels from schools that had not participated.

On top the abovementioned reasons was the typical fact in which schools that were currently participating or had been participating in many other similar programs, had the tendency to be less focused in implementing the energy ambassador program.

Online Platform

One of the most common challenges by conducting the online training was the focus disruption and lack of adequate connection between the trainer/facilitators and participants. Challenges can be minimized by having trainers/facilitators who have adequate experiences. Nevertheless, although the team had been experienced with online training, the challenges continue to happen in the following ways:

- Energy Saving Ambassadors were less focused during the online activities
- The sense of ownership towards this program by the Energy Saving Ambassadors was not optimal
- Difficulty to join online due to signal problems

Learning upon the situation, in order to enhance the learning process and ensure the optimization of material comprehension, carrying out the training through face-to-face interaction was the most preferable and advantageous technique.

Support from the schools and Energy Managers

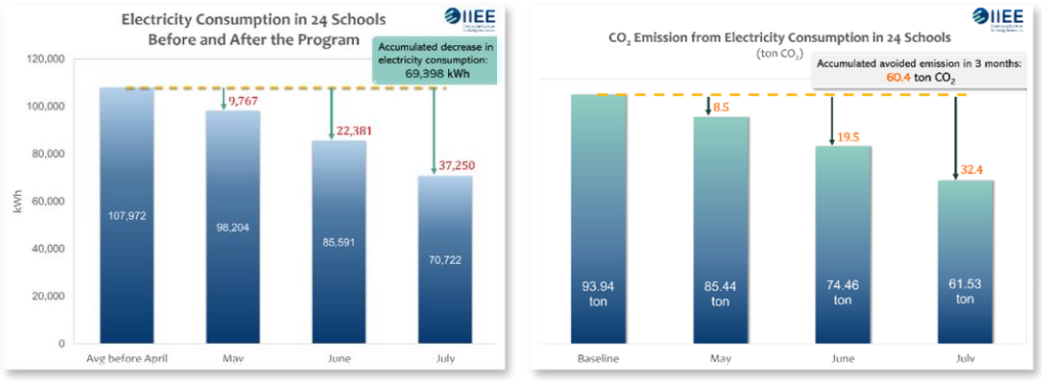
The Energy Saving Ambassadors program is intended not only to produce a generation that understands the importance of energy-saving behavior in supporting climate change adaptation efforts, but also to provide support for one of the government's energy-related programs, namely the energy transition. However, the beneficiaries of this DHE Program are not only the students who are the primary target of education in this program, but also accompanying teachers, particularly energy managers, and the school as a whole. Training on energy saving behavioral changes for teachers and students.

6. ACHIEVEMENT

Electricity Consumption in Schools Before and After the Program and CO_2 Emissions Reduction

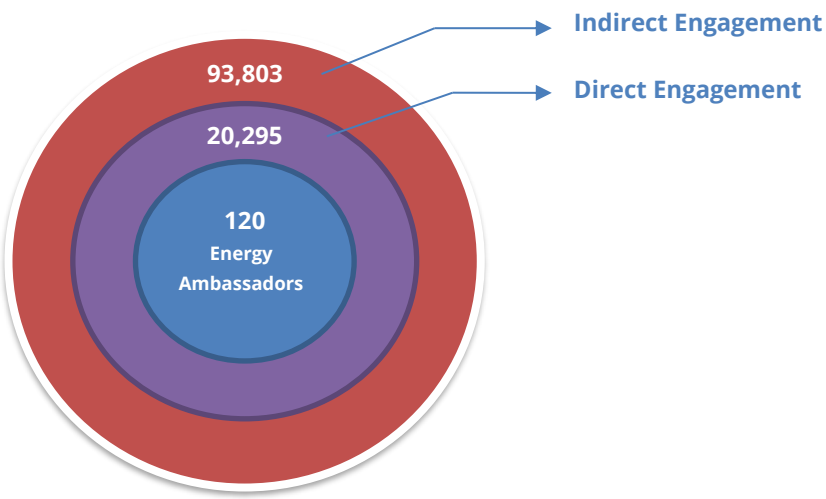
The total accumulated reduction in electricity consumption during the program (3 months) **was 69,398 kWh.** All achievements in reducing electricity consumption were achieved through changing electricity usage behavior, without changing more efficient equipment.

Reducing electricity consumption had an impact on reducing CO_2 emissions. CO_2 emissions generated by schools (24 schools) cumulatively this project had avoided **CO_2 emissions of 60.4 tons** to the environment for 3 months of the program.

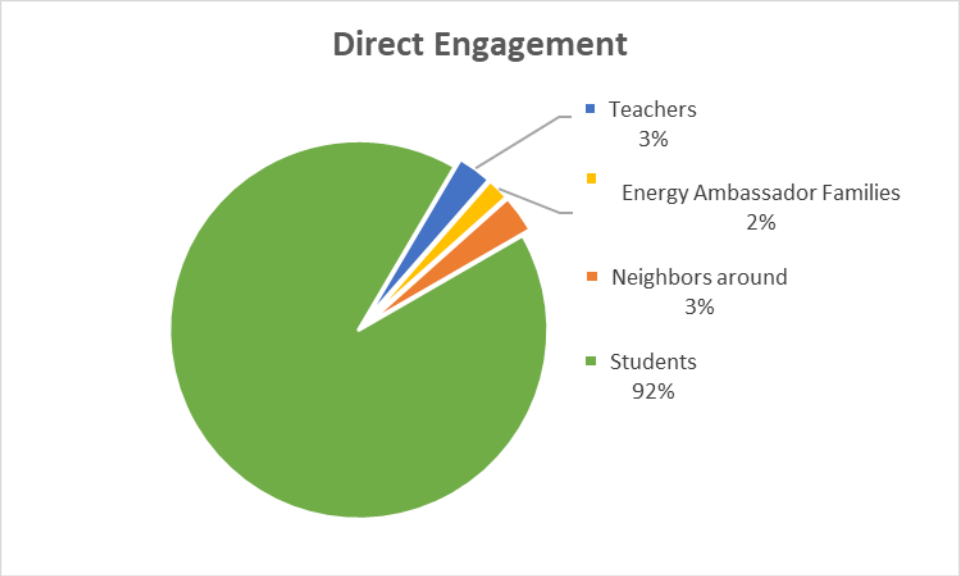


Program Engagements

This program had selected 120 Energy Saving Ambassadors from 24 schools in Surabaya and Gresik. During the program, the Energy Saving Ambassadors carried out various campaign activities to raise awareness of all parties regarding energy conservation and efficiency. They succeeded in creating a snowball effect by directly involving 20,295 people to participate in energy-saving behavior, as well as indirectly engaging 93,803 people.



Campaign activities carried out by the Energy Saving Ambassadors, targeting the closest people. The Ambassadors managed to involve 20,295 people in direct campaign activities. consisting of 18,632 people (92%) are school friends, 605 people (3%) are teachers, 396 people (2%) are families of the energy efficient ambassadors, and 662 people (3%) are neighbors around the Ambassadors' homes and schools.



Campaign activities for other students were carried out in various ways, ranging from open campaigns in the field, campaigns to classes, campaigns at the time of new students' admission, campaigns through poster media, competitions (energy saving mural competition, poster competition, energy saving competition between classes), energy-saving patrols, and so on.

7. PROGRAM SUSTAINABILITY

As implied through the narratives, achievements, and data presented in previous points of this report, the implementation of the "Energy Efficiency and Energy Conservation Awareness Raising in the Education Sector, Including An Energy Saving Competition in East Java Province" went smoothly and successfully. This program also received appreciation from stakeholders and related institutions.

This can be seen from several achievements and support:

1. Support from participating schools, both from the Principals, Energy Managers, other teachers and also from the Energy Saving Ambassadors and other students, as well as support from the environment at Energy Saving Ambassadors' house
2. There is a change in behavior to save energy from program participants, both Energy Managers/Teachers and Energy Saving Ambassadors/students
3. There is a decrease in electricity consumption, both in schools and homes of program participants
4. The reduction in CO_2 emissions is quite good, due to the decrease in electricity consumption both in schools and homes of the participants.

Following the above several points mentioned, also from the observations in the implementation of the program as well as existing data, it can be concluded that this program is very strategic to be replicated. Some of the proposed supports needed may include (but are not limited to):

From the Government

- To include EEC Education as one of the Strategic Working Program Plan of the Ministry of Energy and Mineral Resources.
- To allow schools participating in the PSBE program for the energy efficient buildings category.
- To integrate the EEC program/education material as one of the school curriculum to facilitate the dissemination of EEC knowledge and expansion of its implementation.

From the Donors

- In terms of funding for program replication in other cities/provinces in Indonesia, hence enabling Indonesia, especially from the household sectors, achieve the target for more CO_2 reduction targets, through involving more schools in similar programs (Energy Saving Ambassadors program).

From the Program Executor (Indonesian Institute for Energy Economics)

- The design improved online program or otherwise program should be carried out in full offline format.
- Need to separate the Energy Saving Ambassadors for home and school, so it will focus more on reducing electricity consumption and CO_2 emission.
- Need to enhance and improve the monitoring and evaluation tools and verification for pre-post event.