Co-funded by the Intelligent Energy Europe Programme of the European Union

REPOWERMAP - A European map for promoting renewable energies and energy efficiency

Performance indicators common to the Intelligent Energy Europe programme

2012 - 2014

1. Introduction

The impact of actions carried out with the support of the Intelligent Energy Europe programme (IEE) is quantified with a set of common performance indicators. The present document summarizes calculations of related estimated impacts for the IEE project REPOWERMAP – A European map for promoting renewable energies and energy efficiency.

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2. Results

The results for the calculation of the IEE Common performance indicators are shown in the following table:

Within the duration of the action	
Common Performance indicator	Achievement
Cumulative investment (Euro)	8’200’000
Renewable Energy (toe/year)	400
Primary energy savings (toe/year)	50
Reduction GHG emissions (t CO_2e/year)	1’700

By 2020	
Common Performance indicator	Planned achievement
Cumulative investment (Euro)	82’000’000
Renewable Energy (toe/year)	4’000
Primary energy savings (toe/year)	500
Reduction GHG emissions (t CO_2e/year)	17’000

Table 1: IEE Common performance indicators: Achievements 2012-2014 and planned achievements by 2020 with future activities

In the following paragraphs, the calculations of the common performance indicators are explained.

Outcomes leading to new systems using renewable energies (RES systems):

- In a first year of impact, on a yearly average about 150 unique internet users saw the map with local examples for the use of renewable energies and energy efficiency per day; in the second year of impact, on a yearly average about 450 unique internet users saw the map per day; it is assumed that about 1 in a thousand internet users installs a RES system as a result. This results in approximately 220 additional decisions to invest in RES. The first half year of the action is not counted.
- 1'000 additional visitors to site-visit events; it is assumed that about 10% of them will install RES-systems because of site visits.

→ In total, about 320 additional decisions are taken during project period to invest in RES. It is assumed that 270 concern RES-Heating, while 50 concern RES-electricity, in particular PV.

Decisions for RES-Heating are estimated to trigger an investment of EUR 20'000 on average (conservative) or EUR 5'400'000 in total. Final energy consumption in average building for heating where RES are installed is estimated to be 60'000 MJ per year (150 m^2, energy need approximately 100 kWh/m^2 [M. Friedrich et al (2007) CO_2-Gebäudereport 2007, im Auftrag des Bundesministeriums für Verkehr, Bau und Stadtentwicklung], and conversion efficiency approximately 90%). Providing 270 such buildings with this amount of energy from RES corresponds to 400 toe/a RES energy. Assuming the replacement of 400 toe/a oil with a lifecycle emission factor of 80 g CO_2eq/MJ results in 1'300 t CO_2-eq greenhouse gas reduction per year.

The 50 RES-electricity-systems are assumed to be PV systems, with an average power of 10 kWp, triggering an investment of EUR 30'000 per installation or EUR 1'500'000 in total. RES Electricity production is estimated to be 1 MWh/ kWp per year. This means the 90 PV systems produce around 80 toe/a of electricity. Primary energy savings are neglected (conservative). GHG reductions are calculated on the basis of an emission factor of 460 g CO2eq / kWh. This results in a reduction of 230 t CO_2eq per year.

The effect of triggering additional investments in renewable energy installations because of increased demand in green electricity is neglected (conservative).

Outcomes leading to efficiency measures in buildings:

It is assumed that the installation of RES heating systems in buildings is accompanied by measures on the building envelope that lead to an average reduction of 30% of energy consumption in about 50% of all cases of a building renovation. It is assumed that from the 270 buildings where RES heating systems are installed, 50% are in existing buildings, and 50% are in new buildings. Only primary energy savings in existing buildings are taken into account, the primary energy savings in new buildings are neglected (conservative). This means that for 70 buildings measures on the building envelope are also carried out, with a reduction of the energy need from 140 kWh/m2 per year to 100

kWh/m2 per year. This leads to a reduction of 2.1 million MJ/a energy consumption, taking into account a conversion efficiency of 90%. Applying a primary energy factor of 1.2 for fossil fuel that has been saved compared to the situation before renovation, this results in a primary energy saving of 50 toe/a, while reducing GHG emissions by 170 t/year based on an emission factor of 80 g/MJ. Investment into renovation measures is estimated to amount to EUR 20'000 per building where the building envelope is improved, corresponding to a total investment of EUR 1‘400'000 in energy saving measures.

The following table summarises these results:

	RES-Heat production	RES-Electricity production	Energy saving in building	Total (rounded)
Cumulative investment made by European stakeholders in sustainable energy (EUR)	5’400'000	1’500'000	1’400'000	8'200'000
Renewable Energy production triggered (toe/year)	400	40	-	440
Primary energy savings compared to projections (toe/year)	-	-	50	50
Reduction of greenhouse gas emissions (t CO2e/year)	1’300	225	170	1’700

Table 1-3: Detailed results of calculations on IEE Common performance indicators

For expected outcomes by 2020 it is planned that whereas for the two years of impact during the action the average number of unique users per day was 300, for the following years it will be 1200 on average (conservative), based on the level reached at the end of the action and future activities, and the time period of impact until then will be six years, or three times longer than the impact period during the project; therefore a 9-fold increase compared to what was achieved during the action can be achieved. Taking into account that the yearly emission reductions, renewable energy use and primary energy use achieved on a yearly basis during the project will continue to have an impact, and that the cumulative investment is counted, the expected impact by 2020 is therefore estimated to be a factor of 10 higher than what was achieved during the project period alone, if the necessary support is found to continue the action accordingly.