

# GUIDANCE N

## Energy Efficiency

*Version 1*



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All crops in the scope of the Rainforest Alliance certification system; please see Certification Rules.		Farm Certificate holders	



## OBJECTIVE

Section 6.8 addresses the energy efficiency of certified farms. The section is divided into 6.8.1, which is a core requirement; 6.8.2, which is a mandatory smart meter; and 6.8.3, which is a mandatory improvement requirement. Energy efficiency refers to the ratio of the output of performance, service, goods or energy, vis-à-vis input of energy.

Improving energy efficiency is integral to sustainable agriculture. It includes both increasing the yield per unit of energy and reducing the quantity of a farm's total energy use. Energy efficiency is also key for reducing greenhouse gas (GHG) emissions from agriculture. To verify that energy efficiency has been improved, the energy input per unit yield must have been reduced.

The amount of energy used must be calculated and documented according to the types of energy sources used and the machinery used in operations (production and processing). To increase energy efficiency, producers need to know their business-as-usual energy consumption and decide a target for reduction. Record keeping is therefore, an essential activity in achieving energy efficiency.

Producers can also choose to calculate the greenhouse gas emissions (GHG) from energy use and set a target to reduce emissions, which ideally will result in energy efficiency. To calculate greenhouse gas emissions were commends using the Cool Farm Tool (CFT)<sup>1</sup>. The tool uses the Tier 2 methodology recommended by the Intergovernmental Panel on Climate Change (IPCC) The CFT is one of the simplest yet comprehensive and freely available GHG calculators that facilitate producers' calculations from farm activities.

## SCOPE

This guidance applies to all regions across the globe and targets the use of fossil fuels, electricity, renewable energy, gas, and biomass on various types of crop farms.

## AUDIENCE

This guidance is for use by large farms, individual farms and farm group management.

## GUIDANCE

To meet the **core requirement of 6.8.1** and **mandatory smart meter of 6.8.2**, the following steps should be taken:

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<sup>1</sup> .To use the Cool Farm Tool, refer to guidance for 4.9



## 6.8.1 CORE REQUIREMENT

### Step 1: Quantify and document type of energy sources

- 1.1 Identify and document the production and processing operations that require and use energy.
- 1.2 Categorize the energy consumption equipment into those which stay in a fixed location (*stationary*) (e.g. boiler) and those that move around (*mobile*) (e.g. tractors).
- 1.3 Indicate the type of energy source for individual equipment captured under both stationary and mobile categories and indicate if the energy source is renewable (eg solar power, wind power, biomass (wood, charcoal, dung, biogas etc) or non-renewable. (oil, petrol, diesel, coal, natural gas)
- 1.4 Determine how much energy is used by each of the processes and pieces of equipment listed in the categories above. For example, you can obtain information on units used from bills and receipts. Data required would include gallons/volume of fuel used; kWh of electricity, cubic feet of natural gas.
- 1.5 Calculate the total energy consumption per year. The calculation should include a full calendar year, including all harvest and processing periods. A do-it-yourself farm energy assessment tool can be used. Some are laid out in a checklist/multiple-choice format; others combine checkboxes with numeric entries; others are a complex spreadsheet-style calculator. A range of Farm Energy Calculator tools are identified here<sup>2</sup>.
- 1.5 Calculate total energy consumption per kg of product by dividing the total amount of energy used by the total amount of product produced.

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<sup>2</sup> See annex to guide you to choose the appropriate tool for calculating energy consumption that suits your context.



## 6.8.2 MANDATORY SMART METER

### Step 2: Set targets for energy efficiency and identify efficiency improvement measures

The energy consumption calculation made for requirement 6.8.1 must be used to set targets for improving energy efficiency over time. Certificate Holders must set their own targets based on their current energy use and a realistic plan to improve efficiency. Targets for increased efficiency in energy use must be set and measured using the smart meter tool. Energy efficiency targets and improvement measures identified can also be included as an energy efficiency plan as one of the sections of the farm management plan to help management keep track and regularly measure improvements.

2.1 Set targets to be achieved under an energy efficiency plan. Targets can be in the form of:

- Setting a limit on the amount of total energy to be consumed. This is the indicator “total energy use”. This kind of target means that the total energy consumed in future years will be lower than the current consumption calculated for requirement 6.8.1)
- Setting a percentage increase in efficiency to be achieved. This is the indicator “ total energy use per kg of product”. This kind of target means that the CH will produce the same amount of production with less energy, or will use the same amount of energy to achieve more production)
- Setting a percentage shift from non-renewable to renewable energy sources . This is the indicator “Amounts of renewable and non-renewable energy used, by type” (e.g., volume of fuel, KWh electricity, quantity of biomass energy) This type of target means that more of the energy used will be from for example solar or wind power and less from oil or coal etc than was recorded for section 6.8.1

2.2 Identify measures to reduce energy demand and consumption with reduced dependency on non-renewable energy sources for production and processing. Some examples<sup>3</sup> include:

- Switch from a reliance on fossil fuels to renewable energy sources like wind and solar where feasible.
- Purchase energy efficient machinery/equipment and lights. The best way is to buy products with energy efficiency labels – the higher the number of stars, the more efficient energy use consumption.
- Switch off lights and turn off machinery and unplug when not in use. This reduces “vampire energy<sup>4</sup>” consumption.
- Perform regular and routine maintenance of lights, fans, trucks/tractors, refrigerators, dryers, etc.
- In the dry season, take advantage of natural sunlight to dry produce instead of relying on electric dryers.
- Install moisture sensors in grain drying equipment to avoid over drying.
- Install motion sensor lights and beams.

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<sup>3</sup> For further information and guidance, see links in annex.

<sup>4</sup> Vampire energy is the electric power consumed by gadgets when they are switched off but still plugged in.



### Step 3: Monitor progress and report

- 3.1 Monitor the set targets for increased energy use efficiency yearly using the same farm energy calculation tool used in Step 2 above.
- 3.2 Calculate new total energy use per kg of product. Compare with earlier value obtained in Step 1, activity 6 above to ascertain if energy efficiency was achieved.
- 3.3 Report on progress yearly and revise energy efficiency targets accordingly.

### 6.8.3 MANDATORY IMPROVEMENT

Requirement 6.8.3 only applies If biomass energy is used for processing operations and/or domestic use, to meet the mandatory improvement requirement **6.8.3**, the following activities must be undertaken:

1. Plant trees on the farm or around the farm. to increase the availability of biomass energy (e.g. wood, charcoal) and minimize the direct and indirect effects of biomass use on natural ecosystems

Purchase and use certified or sustainably sourced biomass that did not contribute to forest destruction and/or other natural ecosystems.

### Further information

1. Focus on Energy. (2016). Energy Efficiency Best Practices Guide (Available via this [link](#)).
2. National Center for Appropriate Technology. (2009). Farm Energy Calculators: Evaluations and Recommendations (Available via this [link](#)).
3. Introduction to Energy Efficiency Conservation on the Farm (Available via this [link](#)).
4. <https://www.nal.usda.gov/afsic/energy-efficiency>
5. <https://www.agmrc.org/renewable-energy/energy-efficiency/farm-energy-efficiency>