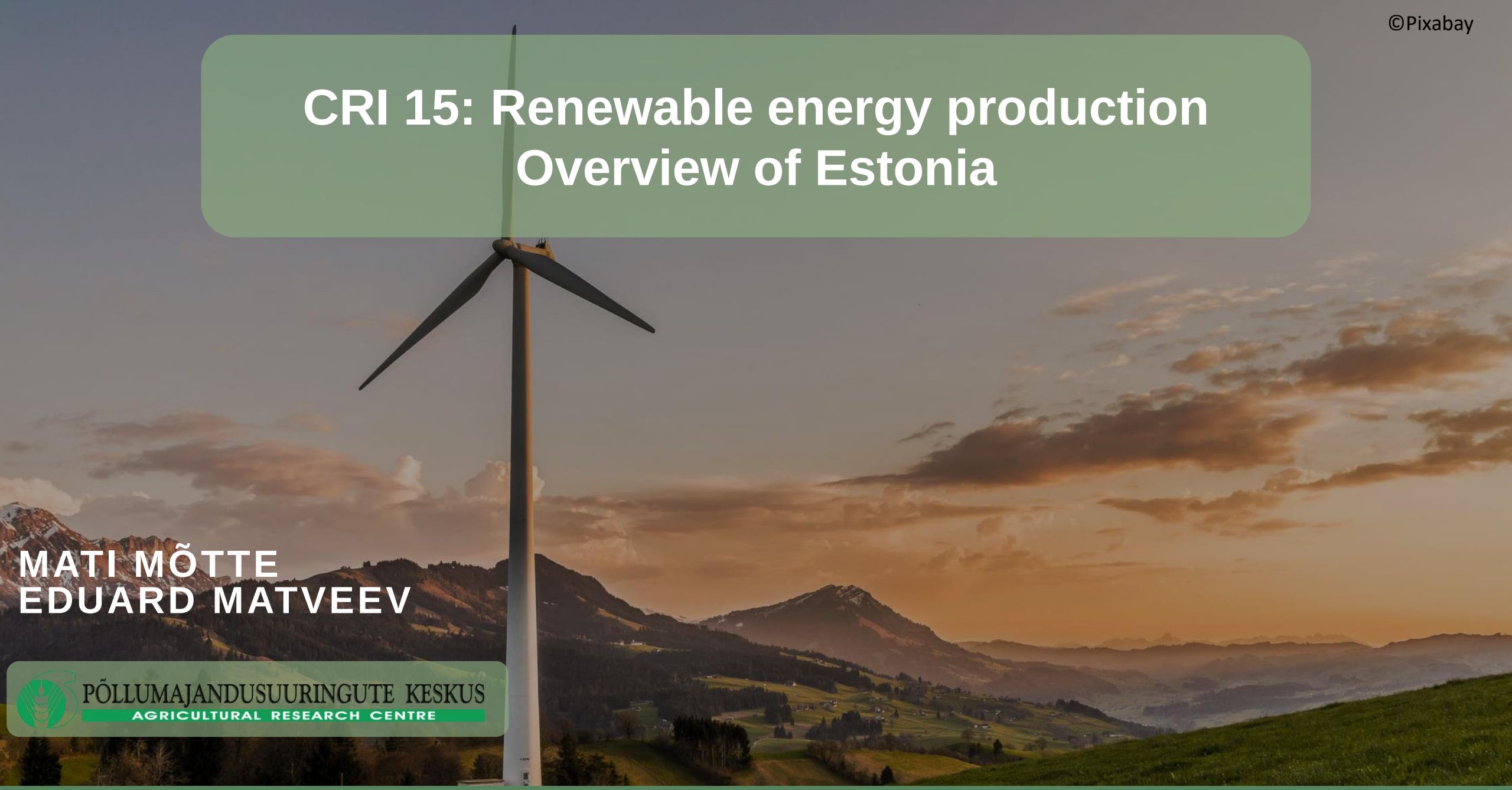

CRI 15: Renewable energy production Overview of Estonia

MATI MÕTTE
EDUARD MATVEEV

PÕLLUMAJANDUSUURINGUTE KESKUS
AGRICULTURAL RESEARCH CENTRE

General introduction

- The development of renewable energy in Estonia has been on the rise in recent years. Estonia's renewable energy potential lies primarily in cogeneration of electricity and heat and wind energy. Small-scale hydropower is also being developed and the use of solar panels is spreading rapidly.
- Overall, the share of renewable energy in final consumption in 2016 was higher than planned. In the Estonian Renewable Energy Action Plan until 2020, the share of renewable energy was forecast at 23.7% in 2016, in reality the share of renewable energy in final consumption was 29.2%.
- According to Eleringi AS, in 2017, a total of 1,620 GWh of electricity was produced from renewable sources. Biomass and waste fuels currently accounts for 58% and solar for 1,2% of the renewable energy resources used for electricity generation in Estonia.

Background

Priority 5. Resource efficiency and shift towards a low carbon and climate resilient economy

5C

Target 2023 - T16 Total investment in renewable energy production 20,5 mln

	Primary contribution				Total	Secondary contribution				Total
	M 1.1−1.3; M2.1; M2.3;	M 8.6	M 16.0; M 16.2;	M 6.4 (financial instrument)		M 4.1; M 4.2	M 6.4	M 16.9	LEADER 19.2; 19.3	
Budget 2014 – 2020	€ 0,51M	€ 6,7M	€ 1,5M	€ 1,4M	€ **11,1M**	-	-	-	-	-
Uptake sum	2 560 €	€ 2,8M	0 €	€ 1,4M	€ **4,2M**	€ 0,06M	€ 4,1M	0 €	€ 0,14M	€ **4,2M**
Uptake rate	0%	42%	0%	100%	**37,8%**	-	-	-	-	-
Number of projects	17	1072	0	4	**1093**	2	46	0	6	**(48) 54**
CRI15	-	0 TOE	0 TOE	-	-	13,3 TOE	458,1 TOE	-	-	**471,4 TOE**

Calculation of CRI 15 – Methodological design

Judgement criteria

a) The supply of renewable energy has increased;

b) The use of renewable energy has increased.

The amount of renewable energy produced from the projects

Common context indicators

a) CCI 43 Production of renewable energy from agriculture and forestry;

b) CCI 44 Energy use in agriculture, forestry and food industry.

Options

a) net effect based on control group or
b) before-after and comparison with macro level

As most of the completed projects were solar panels, it was decided to use a simplified methodology.

Calculation of CRI 15 – Data flow

- First, the intervention and the availability of the necessary data were identified.

  For example, illogical intervention in M 8.6 was identified (investment output is not measurable in units of energy). Also insufficient classification of M 6.4 and LEADER projects.

- Decision to collect data only for the secondary contribution of M 4.1 and M 6.4.

  Collection of data from applications (nominal capacity) at the Paying Agency, because the database was not created.

- Calculation of nominal energy capacity in MWh and GWh according to the collected data. Conversion to TOE equivalents and presentation as CRI 15 indicator.

  Transfer of energy data collected from applications to a single energy unit.

- Answer to the judgement criteria and the evaluation question - comparison with the context indicator CCI 43.

  Comparison of the nominal capacity of projects at the micro level and the total renewable energy production at the macro level.

Calculation of CRI 15 – Final results

- Cumulative calculation of potential energy production

The volume of renewable energy produced by the supported projects has been calculated cumulatively by months from the month of project completion until the end of 2018. Thus, all calculations are made first for each completed project, taking into account its energy production capacity (in kWh) per month and production period (in months), and then the energy produced by all projects is aggregated.

- The highest number of completed projects was in 2017 and 2018 (16 and 23, respectively). In 2015, there was only one completed project and in 2016, 8 projects were completed.
- Of the completed projects (48 in total), the largest solar park has a nominal capacity of 0.55 MWh, the average capacity of a solar power plant is approximately 0.1 MWh. At the end of 2018, the total installed production capacity of renewable energy was approximately 5.3 MWh.
- Based on a study of the productivity of solar panels in Estonia, a nominal power of 10 kW ensures energy production of 8,920 kWh per year.

Challenges and solutions for the calculation of CRI 15

⚠	The **different unit of renewable energy production capacity** by different measures and types of energy, on the basis of which, the conversion to a TOE unit is made.
💡	**Agreement required** for a unit of renewable energy production capacity for the production of heat, biogas, ethanol and electricity (our proposal is to use kWh at the project level and GWh at the macro level).
⚠	**Gaps in the grouping of applications** under the relevant target area, as the intervention could take the form of seven measures 7.
💡	Searching for **suitable investments in the application forms**. Prior cooperation between the managing authority, the paying agency and the evaluator is important to classify the intervention.
⚠	**Missing data on control group.** It was not possible to use PSM-DID or RDD methods for calculating R 15 net–effect. The wording of the judgement criteria- doubtful need to use the PSM method. The result of the energy produced in absolute terms is known.
💡	**Calculation of the nominal amount of energy** and **comparison with the sector**: The share of renewable energy in projects was calculated from the renewable energy production of the agricultural sector. Indicative comparison. Establishing links with context indicators CCI 43 and CCI 44.

Main conclusions and lessons learned

- The financial level for the implementation of measures contributing to objective 5C was 39.6% (of the 2023 target).
- Taking into account the nominal capacity of the supported projects and the average productivity of the solar panel system, a total of 5.5 GWh or 471.4 TOE (R15) of renewable energy was produced in 2016-2018 in Estonia.
- Primary production (agriculture, forestry and fisheries) ensures the production of renewable bio-resources, which enables a sustainable economy in other sectors (bio-economy). The progress made so far will ensure sustainable development in primary production.
- Measure 8.6 projects are aimed at improving the quality of wood, which means that renewable energy is generated from felling waste. Further evaluation of the measure in the target area is not practical.

Recommendations / suggested improvements for ex post and future CAP

The main thing is to make preliminary work to agree which investments are included in this intervention and which is the unit of energy of the different investments. Avoid misunderstandings with units in the applicant's and assessor's view.

Take into account the fact that the main raw data should be collected during the current period and validated by the ex-post evaluator – avoid time pressure. It is recommended to perform a preliminary study 2022 or 2023.

Review of the need to use the PSM-DID or RDD method, as data on the use of renewable energy in agriculture are known (CCI 43) and a comparison of the supported projects with the data of the whole sector provides a sufficient overview of the impact of the support. The indicator is similar to indicator R21/T20 - Jobs created in supported projects.

Based on our experience, it is advisable to assess the efficiency of the support, i.e. the amount of investment per unit of energy. Estimate the cost per unit of renewable energy with the cost of energy from a known fossil or atomic energy.

Thank you

Mati Mõtte
Eduard Matveev

Agricultural Research Centre

Email:
mati.motte@pmk.agri.ee
eduard.matveev@pmk.agri.ee

'ASSESSMENT OF RESOURCE EFFICIENCY AND CLIMATE'
(28 - 29 SEPTEMBER 2020, ONLINE)