Statistics Estonia

Grant Agreement no NUMBER — 101022852 — 2020-EE-ENVACC

Development of environmental accounts

Activity 1. Improving the timeliness and granularity of EPEA/EGSS and expanding EPEA with resource management
products and environmental protection goods.

D1.4. Description of the methodology regarding the improvement of EGSS and EPEA

Methodological report

Raigo Rückenberg (Statistics Estonia)
Grete Luukas (Statistics Estonia)
Kersti Padu (Statistics Estonia)
Kätlin Aun (Statistics Estonia)

Kaia Oras (Statistics Estonia)

29.06.2023

We would like to thank Eurostat for providing the grant to improve the timeliness and granularity of EPEA/EGSS and expanding EPEA with resource management products and environmental protection goods.

Special thanks goes to Sjoerd Schenau from Statistics Netherlands for consulting us through out the grant project!

Contents

Overview of the work done and the introduction to the structure of the document 5
1 Improving the timeliness of EPEA and EGSS 6
1.1 Overview 6
1.2 Methodology for compilation of EGSS T+15 6
1.2.1 Improving methodology for output of energy efficient renovation 12
1.2.2 Results of EGSS T+15 13
1.2.3 Possibility to improve the timeliness of EGSS on quarterly basis 17
1.3 Methodology for compilation of EPEA T+15 19
1.3.1 Results of EPEA T+15 21
2 Improving the granularity of EGSS 23
2.1 Overview 23
2.2 Methodology 23
3 Expanding EPEA with resource management products and environmental protection goods in Estonia 27
3.1 Overview 27
3.2 List of products considered for this grant 27
3.3 Methodology for calculating the consumption of electric and more resource efficient transport equipment 29
3.4 Methodology for calculating consumption of septic tanks 31
3.5 Methodology for calculating consumption of waste containers 32
3.6 Methodology for calculating consumption of organic food 33
3.7 Methodology for calculating consumption of organic agricultural goods 34
3.8 Methodology for calculating consumption of electricity from renewable sources 35
3.9 Methodology for calculating consumption of heat from biogas 38
3.10 Methodology for calculating consumption of solar panels 39
3.11 Methodology for calculating consumption of boilers for burning wood 39
3.12 Methodology for calculating consumption of compact fluorescent lamps (CFL) and most efficient domestic appliances 40
3.13 Methodology for calculating consumption of heat pumps 41
3.14 Methodology for calculating the consumption of low energy and passive buildings 42
3.15 Supply and use tables for the environment and resource management goods assessed ... 43
3.16 Use table for the environment and resource management goods assessed 45
3.17 Supply table for the environment and resource management goods assessed 46
3.18 Extra cost table 47
3.19 Questions and remaining issues related to specific environment and resource management goods assessed 48

3.20 products.. 48
3.21 Used materials.. 49
ANNEX 1. Expanding EPEA with resource management products and environmental protection goods in Estonia 50
1.1. Overview of Association of Issuing Bodies (AIB).. 50
1.2. Seminar for the introducing of the results*, summary... 51
*Improving the timeliness and granularity of EPEA and EGSS and expanding EPEA with resource management products and environmental protection goods in Estonia... 51

Overview of the work done and the introduction to the structure of the document

Current methodological report outlines the work carried out for developing environmental monetary accounts in Statistics Estonia from 2021 till 2023 under the grant agreement Grant Agreement no NUMBER — 101022852 — 2020-EE-ENVACC, Development of environmental accounts.

This document describes the work done under activity 1 improving the timeliness and granularity of EPEA (Environmental Protection Expenditures Account) and EGSS (Environmental Goods and Services Sectors' account) and expanding EPEA with resource management products and environmental protection goods.

In the first chapter of the document overview is given on the improving the timeliness of EPEA and EGSS compilation and the efforts taken, and methods established for earlier data release. Main effort was directed towards earlier compilation of annual data. Both EPEA and EGSS were developed for T+15 and respective methodology was described. For quarterly estimations currently no efficient methodology for reporting on common aggregates level (on economic activities level) was not feasible to be established as the market for environmental goods in Estonia is small and heterogeneous. In addition, currently the applied methods comprise both top-down and also bottom-up approaches. The bottom-up approaches data would be feasible to be used only for certain environmental goods on quarterly bases.

In the second part of the document overview is given on the improvement of the detail and granularity of EGSS and EPEA regarding the production of energy from renewable resources. This area has more importance and more granular information regarding renewable energy products and services has been asked for. So an attempt has been made to compile an account on more policy relevant level.

Regarding renewable energy resources the objective was to gain more granular information regarding renewable energy products and services to enhance the quality and usability of this statistics.

In the third chapter of the document overview is given on the extensive investigation for expanding EPEA with resource management products and environmental protection goods in Estonia. This work comprised both stakeholders consultations and also the production of this new statistics.

In all areas the consultations with Statistics Netherland were extremely useful in order to define methodologies, identify data sources, compile statistics and validate the results.

1 Improving the timeliness of EPEA and EGSS

1.1 Overview

One objective for this area of work in current grant project was to obtain timelier data on EGSS (Environmental Goods and Services Sectors' account) and EPEA (Environmental Protection Expenditures Account), which will increase the value of these accounts to the users. Regulation 691/2011 makes obligatory to compile EGSS and EPEA and transmit EGSS data sets in T+22 and EPEA data in T+24, but during this grant project the effort was made to produce EGSS and EPEA both in T+15 – i.e. accordingly 7 and 9 months before the regulation requires. One subtask was also to examine in addition the possibility to produce EGSS on a quarterly basis.

As an outcome of this area of work data for EGSS and EPEA T+15 were compiled for the year 2021 and respective methods were described in current report. Feasibility of the production of quarterly estimates was analyzed and described.

Consultation with Statistics Netherlands on the results for improving timeliness of EPEA and EGSS and also on EGSS quarterly outcomes was held and feedback and some additional suggestions were received on possible further improvement on annual timeliness EGSS and EPEA and quarterly EGSS estimates. The results were considered useful and good.

1.2 Methodology for compilation of EGSS T+15

During this grant project, an effort was taken to compile EGSS 7 months earlier than the regulation 691/2011 annex requires. First step to achieve this goal was to create a database which would comprise information on data availability and time dimension for all data sources used for compiling EGSS. Data sources used in compiling EGSS are listed in Table 1.

Mapping the data sources and the timeliness gave an overview, where the bottlenecks are for compilation EGSS T+15, or in other words, which data sources become available too late. Also, gathering all data sources in one database allows easier coordination of currently just rather loosely connected data processing for compilers of EGSS, EPEA and environmental subsidies accounts.

Table 1. List of data sources and data availability used for compilation of EGSS

Data sources	Variable	Data availability	Time dimension
Revised data aggregates of goods export by NACE categories	Export	T+36	Year
Changes in enterprises' activity classification according to the national accounts' rules	Output	T+29	not relevant
Investments (P.51) by NACE in supply and use tables	Output	T+29	Year
National accounts' aggregates on exports (P.611, P.612, P.613, P.62, P.63)	Export	T+29	Year
Area of hunting districts from the publication "Forest" published by Estonian Environment Agency	Output	T+18	Year
Construction statistics: construction production in Estonia by type of construction	Output	T+14	Year
Export data of goods (revised data)	Export	T+14	Year
PRODCOM data on production and exports	Output, Export	T+14	Year
Enterprises` turnover data from SBS survey EKOMAR	Output	T+13	Year
Environmental protection expenditures survey data (specialised producers)	Output	T+13	Year

Expenditures of general government by function and sub-sector (consolidated)	Output	T+13	Year
Average output of organic farming establishment according to FADN (Farm Accountancy Data Network)	Output, Value Added, Employment	T+12	Year
Environmental protection expenditures survey data (non-specialised producers)	Output	T+10	Year
R&D output (P.11, P.12, P.13) by institutional sectors in national accounts	Output	T+10	Year
Expenditures for construction of noise barriers (state owned) and non-motorized roads by Estonian Transport Administration	Output	T+9	Year
National Accounts data from production account and generation of income account	Output, Value Added	T+9	Quarter
Export data of services (revised data)	Export	T+9	Quarter
National Accounts data on investments (P.51) by the type of investments and by NACE	Output	T+9	Quarter
Number of organic farming farms from Ministry of Rural Affairs	Output	T+9	Year
Annual Elering's data on solar energy producers	Output	T+8	Year
Employment data by NACE in national accounts	Employment	T+8	Quarter
Alternative: Total output of enterprises calculated by VAIS IT-tool (using only Annual Report data)	Output	T+7	Year
Enterprises' annual reports data in Estonian Business Register	Output	T+7	Year
Estonian Building Register data on share of energy class A from total energy classes	Output	T+6	Year
Subsidies given by KredEx to apartment associations	Output	T+6	Day
Expenditures data on replenishment of fish stocks (State Forest Management Centre)	Output	T+5	Year
Subsidies of Estonian Agricultural Registers and Information Board	Output	T+5	Year
Estonian Environmental Board data on expenditures made to control the spread of the population of Heracleum sosnowskyi	Output	T+3	Quarter
Expenditures data from State Forest Management Centre	Output	T+3	Year
Export data of goods (preliminary data)	Export	T+3	Month
Export data of services (preliminary data)	Export	T+3	Quarter
Subsidies data of Estonian Environmental Investment Centre	Output	T+3	Day
Construction statistics: floor area of dwellings and non-residential buildings according to the building permits	Output	T+2	Quarter
Environmental Investment Centre`s Forestry Department`s data on its subsidies for forest reforestation	Output	T+2	Year
Own final consumption of fuel wood from national accounts	Output	T+2	Year
Subsidies of European Union Structural Funds	Output	T+1	Day
Price statistics: price index of repair and reconstruction works	Output	T+1	Quarter
COFOG data from Public Sector Financial Statements	Output	T+0	Month
Cost of additional feeding of game species estimated by Estonian Hunters' Society	Output	T+0	Year
Estimations on the share of wastewater treatment and water supply service	Output	T+0	Year
List of EGSS enterprises	Output	T+0	not relevant
Data on vehicle technical inspections by enterprises	Output	T+0	Month
Output data from Public Sector Financial Statements	Output	T+0	Month
Data on the cost of measurement of exhaust gases in vehicles (information available in enterprises` home pages)	Output	T+0	Year
Business register for statistical purposes, updates	Output	T-2	not relevant
Share of engineering services in cost of constructions (data of Purchasing power parities)	Output	T-4	Year

Market of environmental protection (EP) and resource management (RM) services and goods in Estonia is small. Depending on the type of EP and RM goods and services, impact of few big producers can be significant for the outcomes of EGSS. Also, production of some EP and RM services and goods is often for enterprises secondary activity. This means that EGSS enterprises can be found in every NACE. All these aspects make the use of benchmarks based aggregates rather difficult. Benchmarks based on national accounts data on output by economic activities are not suitable for EGSS in Estonia, as the structures of output in whole economy do not represent the structures in EGSS. Hence, the same logic and methodology used for the compiling EGSS T+22 were also used for EGSS T+15. Using the same methods both for EGSS T+22 and T+15 is more time consuming, but the results were more accurate than using general benchmarks.

The biggest difficulty of compiling EGSS T+15 as the same way as T+22 raised, when the important data sources were available too late for EGSS compilers. This problem concerned SBS survey EKOMAR data and PRODCOM data, where EKOMAR was available T+13 and PRODCOM T+14. EKOMAR and PRODCOM data are both large and complex databases, which means that data processing is more time consuming. So, time period between these data become available and the target time EGSS has to be compiled is too short. Also, both are important data sources regarding calculation of output of EP and RM services and goods with high priority. Therefore, it was critical to find alternatives to find important EGSS input data earlier.

SBS survey EKOMAR database is input data source for the compilation of output of top four biggest EP and RM services and goods (excl. energy efficient new construction). EKOMAR data on enterprise's output components (turnover, services and real estate purchased for resale, etc.) are necessary for calculation of each EGSS enterprise's total output. Total output of EGSS enterprises is important input for further calculation of enterprise's EP and RM service and good, when calculating the environmental share of enterprise's revenues to enterprise's total output. Good approximation for EKOMAR data on output are the data from annual financial reports collected by Estonian Business Register. Filling these annual reports with financial variables (which also can be used for calculating enterprise's total output) are obligatory to all enterprises and NPISH (Non-Profit Institutions Serving Households) active in Estonia. Also, an advantage of annual reports data is that these data are available already at T+7.

As already mentioned, EKOMAR data are used in compilation of the biggest top four output categories of EGSS. Size of waste treatment output T+15 (753 million euros in 2021) was the biggest in Estonian EGSS. Annual reports' data were used for compilation of waste treatment output for T+15. Waste treatment output for T+22 was 842 million euros considering EKOMAR as source data. Comparison of waste treatment output T+22 and T+15 is presented in Table 2. Table 2 shows that the difference between total output T+15 and T+22 was only 89 million euros (it's around 10% from waste treatment output T+22). The biggest difference in waste treatment output was in NACE G 46, where enterprises with the activity of wholesale of waste and scrap belong to. It became known now that in this activity, EKOMAR data give the better result than annual reports' data, but still differences between the total number of waste treatment output T+15 and T+22 are not big. Output of wholesale and retail trade is calculated differently in national accounts than for other activities in corporations' sector (S.11). For the needs of national accounts, the EKOMAR survey is designed to have more detailed financial data on enterprises and so it gives more precise outcome than annual reports' data do.

Table 2. Comparison of waste treatment output T+22 and T+15, 2021, Million euros

NACE	Output T+22: Waste treatment	Output T+15: Waste treatment	Differences in output
TOTAL	841.93	752.90	89.03
A 01			
A 02			
B 05 - B 09	2.89	2.62	0.27
C 10 - C 12	3.08	3.07	0.01
C 13 - C 15			
C 16	0.11	0.04	0.07
C 17			
C 19			
C 20			
C 22	0.10	0.32	-0.22
C 23	0.02	0.02	0.00
C 24	49.86	48.98	0.88
C 25			
C 26			
C 27			
C 28			
C 29			
C 30			
C 31 - C 32	0.07	0.07	0.00
C 33			
D 35	0.05	0.08	-0.03
E 36			
E 37 - E 39	725.55	669.64	55.91
F 41 - F 43	1.79	1.64	0.15
G 45	1.18	0.40	0.78
G 46	50.05	18.74	31.32
G 47	0.29	0.29	0.00
H 49	0.88	0.86	0.03
H 52	0.06	0.06	0.00
I 55 - I 56			
J 62 - J 63			
L 68	1.39	1.48	-0.10
M 69 - M 70			
M 71	0.19	0.19	0.01
M 73			
M 74 - M 75			
N 77			
N 78			
N 80 - N 82	4.24	4.24	0.00
O 84			
P 85			
Q 86			
Q 87 - Q 88			
R 93			
S 94			
S 95			
S 96	0.14	0.18	-0.04

Another important data source, which had to be replaced for EGSS earlier outcome T+15, was **PRODCOM**. PRODCOM data are not available until T+14 in Estonia, which is too late for the EGSS T+15. PRODCOM data were used for the compilation of output and export of miscellaneous EP and RM goods in T+22. As the name of this methodology block (Miscellaneous EP and RM goods) refers, it consists of wide range of different EP and RM goods almost in every category of CEPA (Classification of Environmental Protection Activities) and CREMA (Classification of Resource Management Activities). The size of output of miscellaneous EP and RM goods (528 million euros in 2021) was on third place in top three. PRODCOM data contain information on production and export of goods by CPA codes (Classification of Products by Activity) and these data go into calculation of EGSS output and export.

However, when PRODCOM data are not available yet, the alternative data sources must be found. Speaking of output, PRODCOM production data could be replaced with financial data from annual reports in conjunction with the information on the share of EP/RM goods of every EGSS enterprise's turnover. The list of EGSS enterprises along with the information about their environmental shares of EP and RM goods and services has been gathered into a database during compilation of EGSS. Environmental share can be applied to EGSS enterprise's total output, which is calculated using annual report's financial data. Results on comparison of output of miscellaneous EP and RM goods are shown in Table 3

As for export, preliminary (unrevised) trade statistics T+3 was used instead of PRODCOM data on exports (T+14). Conformity of export data in both data sources is good, even though the classifications are different: Combined Nomenclature (CN) in trade statistics and Classification of Products by Activity (CPA) in PRODCOM data. After transition of CN codes to CPA codes in trade statistics, the results of miscellaneous EP/RM goods' export based on trade statics were similar to those results which based on PRODCOM data (comparison of exports in Table 3).

Table 3. Comparison of miscellaneous EP/RM goods output and export T+22 and T+15, 2021, million euros

NACE	Output T+22: miscellaneous EP/RM goods	Output T+15: miscellaneous EP/RM goods	Differences in output	Export T+22: miscellaneous EP/RM goods	Export T+15: miscellaneous EP/RM goods	Differences in export
TOTAL	473.93	534.96	-61.02	206.30	222.01	-15.72
A 01						
A 02						
A 03						
B 05 - B 09	8.65	8.65	0.00	1.74	1.74	0.00
C 10 - C 12						
C 13 - C 15	0.48	0.48	0.00	0.31	0.31	0.00
C 16	40.41	43.54	-3.14	18.57	18.65	-0.07
C 17	23.49	23.92	-0.43	20.69	18.63	2.06
C 18	8.30	10.20	-1.90	2.87	3.26	-0.39
C 20	40.93	41.59	-0.66	3.31	3.24	0.07
C 22	94.12	96.21	-2.09	21.94	21.40	0.55
C 23	80.84	90.18	-9.34	34.44	26.63	7.81
C 24	48.83	48.83	0.00	18.38	18.38	0.00
C 25	22.80	24.59	-1.79	5.15	4.95	0.20
C 26	9.43	27.86	-18.42	7.03	18.01	-10.98
C 27	41.77	67.78	-26.01	39.91	66.35	-26.44
C 28	14.75	23.56	-8.81	5.93	5.84	0.09
C 29	32.43	21.40	11.03	25.52	14.12	11.40
C 30	0.20	0.29	-0.09	0.09	0.10	0.00
C 31 - C 32	0.90	0.36	0.54			
C 33	0.22	0.22	0.00			
D 35	0.10	0.03	0.07			
E 37 - E 39	0.04	0.04	0.00	0.01	0.01	0.00
F 41 - F 43	1.23	1.23	0.00			
G 45						
G 46	1.42	1.42	0.00	0.39	0.39	0.00
G 47	0.37	0.37	0.00			
H 49						
H 52						
H 53						
I 55 - I 56						
J 62 - J 63	0.22	0.22	0.00			
L 68	1.25	1.25	0.00			
M 69 - M 70						
M 71	0.27	0.27	0.00			
M 72						
M 74 - M 75	0.33	0.33	0.00	0.01	0.01	0.00
N 77						
N 78						
N 80 - N 82	0.15	0.15	0.00			
R 93						
S 94						
S 95						

In addition to SBS survey EKOMAR and PRODCOM survey, there are also few data sources becoming available late, but do not need alternative data sources for compiling EGSS.

Statistics on construction production in Estonia by type of construction becomes available in T+14 (data for the year 2021 were available in the beginning of February in 2023) and it is one essential component for the estimations of output of energy efficient new buildings and energy efficient reconstructing. These basic construction statistics are used for making structures to divide the national accounts' investments (P.51 on dwellings and other buildings and structures) between investments on reconstruction and new construction by the type of buildings. At this development project good alternatives were not found for replacing construction statistics. But even though the time period is short for making calculations for EGSS, timely calculations are still achievable, because calculations are easily done on aggregated level.

For example, one of this kind of data sources is **consolidated data on expenditures of general government by functions and sub-sectors**, which is important data source for calculation of output of miscellaneous EP/RM services provided by government sector. After these data become available for EGSS compilers, it leaves 2 months before entire EGSS account has to be finished. Time period is short, but still long enough to make calculations for miscellaneous EP/RM services provided by government sector in time (T+15).

Environmental protection expenditures' data are ready in T+10 and in T+13, depending on the type of the survey (surveys on specialized and non-specialized producers). Environmental protection expenditures' data are mainly used for compilation of environmental protection services provided within the enterprise (ancillary output), but also for the estimations of ancillary output of construction services related to facilities made for environmental protection (e.g wastewater treatment plants, waste treatment facilities etc.). Minimum time period is 2 months between data on environmental protection surveys are available and EGSS aggregates have to be compiled. Regarding EGSS, the further processing of environmental protection expenditures' data is simple and takes a little time, so all calculations for the EGSS outcome are made in time (T+15).

1.2.1 Improving methodology for output of energy efficient renovation

Methodology for output of energy efficient renovation was improved. In collaboration of experts from Tallinn University of Technology, new data sources were found and more precise methodology was developed for the calculation of the output of energy efficient renovation.

Weakness of the previous methodology was that the whole number of square meters from building permits for renovation were taken into output calculation. However, building permits in Building Register do not provide information in what extent the renovation is done (or is it done at all), it only gives the right to make construction and renovation works. And that was the reason why output figures calculated by old methodology were over estimated. New improved methodology gives more realistic output figures for energy efficient renovation in Estonia.

The new method for the estimations of output of energy efficient renovation were adopted from the National Long-Term Strategy for the Renovation of Buildings (in Estonian: "*Riiklik hoonete rekonstrueerimise pikaajaline strateegia*") with the help of the experts from Tallinn University of Technology that were also members in the strategy's research group.

In general, methodology adopted for output of energy efficient renovation is still based on top-down approach, but the different methods were used for output estimations by the type of buildings (respectively small residential buildings, apartment buildings and non-residential buildings). Apartment buildings in Estonia are mostly renovated more energy efficient with the help of fundings from European Union and state budget. Data on project's total costs financed from European Union Structural Funds and data on state funding by KredEx were used to estimate the size of the output of energy efficient renovation of apartment buildings.

Regarding small residential buildings and non-residential buildings, the approach was different. Total annual numbers of renovated square meters were taken from building permits. The complete renovation rate was applied to building permits' data on renovated square meters to find out how much square meters were renovated completely. Experts from Tallinn University of Technology have evaluated the unit costs for energy efficient renovation (EUR per m^2) by the type of buildings. Using renovated square meters data and multiplying this with unit cost give an estimation for output of energy efficient renovation for small residential buildings and non-residential buildings.

Improvement in methodology for output of energy efficiency renovation effects total output of EGSS, because output of energy efficient renovation service has significant size in EGSS (in top five). It means that later whole time series beginning from 2014 have to be revised. Revision in time series can be done after the contracts with the data holders are signed and their data of earlier years are transmitted to Statistics Estonia. The size of energy efficient renovation output computed by old and new methodology is presented in Figure 1, where the year 2021 represents new improved methodology and output numbers for earlier years (2014-2020) illustrate old methodology.

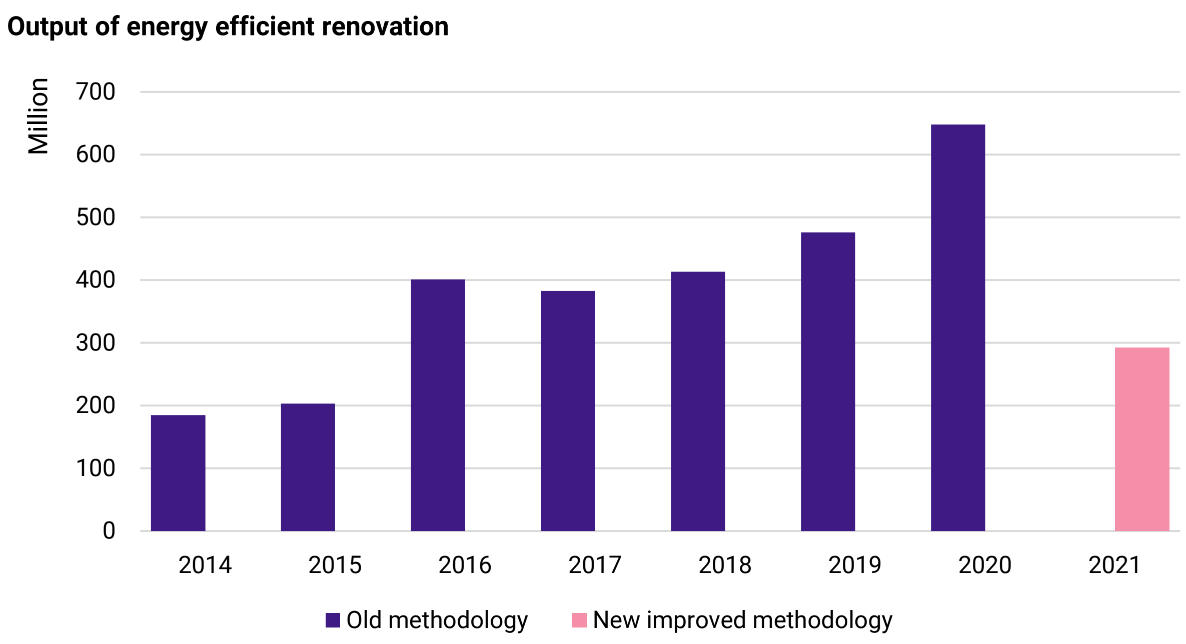

Figure 1. Time series of output of energy efficient renovation, 2014-2021, Million euros

1.2.2 Results of EGSS T+15

In 2021 output of EGSS T+15 made up 4.1 billion euros, value added was 1.5 billion euros, export 0.72 billion euros and employment 33 917 in FTE (Full Time Equivalent). When compare the size of variables between EGSS T+15 and T+22, the differences are really insignificant (Table 4). This means that methodology elaborated for more timely EGSS (T+15) is giving reliable results.

Table 4. Comparison of size of EGSS T+22 and T+15, 2021

Variable	EGSS T+22	EGSS T+15	Difference
Output, Million euros	4 098.45	4 123.10	-24.64
Value Added, Million euros	1 482.59	1 485.23	-2.64
Export, Million euros	749.81	715.26	34.55
Employment, Full Time Equivalent	32 458.09	33 036.74	-578.65

Regarding different CEPA/CREMA categories, the biggest part (37%) of EGSS output is related with CREMA 13B (heat/energy saving and management) services and goods (1.51 billion euros in 2021). Services and goods in CREMA 13A (production of energy from renewable resources) made up 22% (i.e. 0.89 billion euros) from EGSS total output and then followed CREMA 14 services and goods with the 0.54 billion euros (i.e. 13% from total output). Output of EGSS T+15 allocated by different CEPA/CREMA categories is also presented in Figure 2.

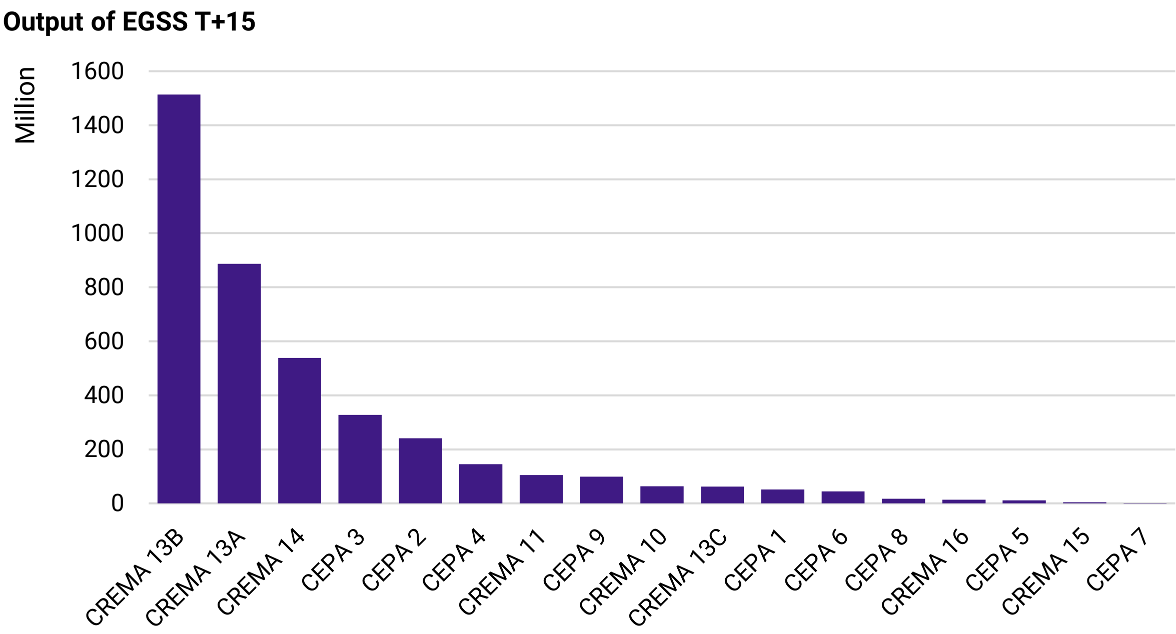

Figure 2. Total output of EGSS T+15 by CEPA and CREMA categories, 2021, million euros

Table 5 gives an overview on results of the EGSS T+15 variables by the EP and RM services. According to the size of output, the biggest in top three were waste treatment (incl. handling of secondary raw materials) with output of 0.75 billion euros in 2021, energy efficient new construction (0.74 billion euros) and miscellaneous EP and RM services and goods (0.53 billion euros). Such distribution of EP and RM services and goods as it is brought out in Table 5 shows EP and RM services and goods, where the different methods for compilation of EGSS have applied.

Table 5. Output, export, value added and employments of EGSS T+15

Services/goods	Categories of CEPA/CREMA	Output	Value Added	Export	Employment
TOTAL	All CEPA/CREMA	4 123.10	1 485.23	715.26	33 036.74
Waste treatment (incl. handling of secondary raw materials)	CEPA 3. CREMA 11B, 13C, 14	753.74	192.84	263.46	2 051.26
Energy efficient new construction	CREMA 13B	743.62	272.15	55.15	7 519.98
Miscellaneous EP/RM goods	All CEPA/CREMA	534.96	148.71	222.01	3 905.98
Production of fuel wood and wood chips	CREMA 13A	416.86	100.36	144.11	2294.43
Energy efficient reconstructing	CREMA 13B	291.94	107.02	21.67	2 957.86
Electricity produced from renewables	CREMA 13A	256.20	107.68		704.73
S.11: Miscellaneous EP/RM services provided by enterprises	All CEPA/CREMA	203.59	83.40	7.69	2 266.83
S.13: Miscellaneous EP/RM services provided by government sector	All CEPA/CREMA	203.00	133.71		3 535.57
Heat produced from renewables	CREMA 13A	128.12	40.06		595.35
Wastewater treatment service	CEPA 2	116.83	69.28		1 160.80
Organic farming	CEPA 4	108.72	87.55		2 247.30
Construction services for wastewater treatment plants	CEPA 2	74.03	27.31		751.71
Forest protection and regeneration	CREMA 11A	64.99	20.74		404.72
Construction services for water distribution systems	CREMA 10	45.28	16.71		459.79
Energy saving from Combined Heat and Power Systems	CREMA 13B	37.15	14.77		108.94
Construction services related to protection of ambient air	CEPA 1	22.69	8.33		230.26
Research and development	CEPA 8, CREMA 15	20.48	16.96	1.16	777.07
Energy efficient street lighting	CREMA 13B	19.88	7.30		201.76
S.15: Miscellaneous EP/RM services provided by NPISH	All CEPA/CREMA	14.36	6.08		239.87
Remediation of soil pollution	CEPA 4	14.01	4.21		87.14
Renovating central heating systems	CREMA 13B	11.16	4.10		113.28
Construction of noise barriers and non-motorized roads	CEPA 5	10.47	3.87		106.98
Environmental protection services provided within the enterprise	All CEPA	7.57	2.81		21.85
Protection of semi-natural landscapes	CEPA 6	7.42	2.62		97.01
Transition of heating systems from fossil fuels to renewable energy	CREMA 13A	5.75	2.15		59.49
Measurement of exhaust gases in vehicles	CEPA 1	5.19	2.63		81.75
Construction of waste treatment facilities	CEPA 3	2.74	1.00		27.77
Protection of game	CEPA 6	0.98	0.43		15.29
Replenishment of fish stocks	CEPA 6	0.58	0.20		5.13
Construction services for fish passages	CEPA 6	0.41	0.15		4.21
Control of invasive fauna and flora	CEPA 6	0.37	0.12		2.61

When allocating production of EP and RM services into economic activities (Table 6), the biggest EGSS output has produced in construction sector (F 41–43) mainly due to energy efficient new construction and renovation of existing buildings more energy efficient. Then followed NACE 37-39 (sewerage, waste management and remediation) with the output of waste treatment services (incl. handling raw materials). Manufacture of wood and paper products (NACE 16) was on the third place, mainly with its production of fuel wood and wood chips. Electricity, gas, steam and air conditioning supply (D 35) was the fourth among the biggest producers of EGSS.

Table 6. Output, value added and export of EGSS T+15 allocated into NACE activities, 2021, Million euros

NACE activities	Output T+15	Value Added T+15	Export T+15
TOTAL	4 123.10	1 485.23	715.26
A 01	116.08	89.56	
A 02	89.19	28.22	3.49
A 03	0.09	0.04	
B 05 - B 09	40.18	21.02	1.74
C 10 - C 12	6.57	1.58	
C 13 - C 15	1.22	0.39	0.31
C 16	485.56	111.03	159.24
C 17	45.47	11.16	18.63
C 18	10.39	3.45	3.26
C 19	8.68	2.69	
C 20	42.67	10.11	3.24
C 21	0.79	0.26	
C 22	96.78	28.71	21.40
C 23	90.57	27.89	26.63
C 24	97.88	27.48	18.51
C 25	25.57	7.35	4.96
C 26	28.19	4.99	18.01
C 27	68.00	18.19	66.35
C 28	24.17	7.22	5.84
C 29	21.44	4.83	14.12
C 30	0.38	0.10	0.10
C 31 - C 32	2.71	0.84	0.03
C 33	2.52	0.93	0.48
D 35	336.01	142.19	
E 36	72.87	50.24	
E 37 - E 39	687.26	166.61	256.72
F 41 - F 43	1287.48	458.81	73.75
G 45	2.05	0.92	0.01
G 46	26.40	13.13	7.00
G 47	11.24	6.10	
H 49	1.54	0.52	
H 50			
H 51			
H 52	0.83	0.23	
H 53	0.07	0.02	
I 55 - I 56	0.49	0.20	
J 58	0.04	0.02	
J 59 - J 60			
J 61	0.02	0.01	
J 62 - J 63	7.32	5.29	
K 64	0.02	0.02	
K 65			
K 66			
L 68	8.17	5.33	
M 69 - M 70	1.39	0.77	0.17
M 71	102.67	54.28	6.77
M 72	22.38	18.32	0.77
M 73			

M 74 - M 75	6.33	2.42	1.42
N 77	0.94	0.51	
N 78	0.10	0.06	
N 79	0.11	0.04	
N 80 - N 82	22.51	12.67	1.17
O 84	197.17	128.52	
P 85	0.24	0.17	
Q 86	0.11	0.07	
Q 87 - Q 88	0.07	0.05	
R 90 - R 92	0.54	0.35	
R 93	1.33	0.56	0.01
S 94	19.70	8.50	1.11
S 95	0.02	0.01	
S 96	0.56	0.25	

1.2.3 Possibility to improve the timeliness of EGSS on quarterly basis

One task for this grant project was to investigate also the possibility to produce EGSS aggregates quarterly. This subject was also discussed with Statistics Netherlands in study visit held in November, where Statistics Netherlands experts introduced what they have done in the field. The main suggestion from Statistics Netherland was to analyze possible data sources to compile early estimates and use available proxies. Methodologies were also consulted on virtual meetings.

Final consultation with Statistics Netherlands on timeliness of EGSS quarterly outcome was held at the end of the project and feedback and some additional suggestions were given on possible further improvement on quarterly EGSS estimates. The results were considered useful and good. Methodological suggestions from Statistics Netherlands were given in order to continue further work on quarterly estimates on the EGSS goods such as electricity and heat produced from renewables and also to try quarterly estimates on the organic farming.

First step was to map the data sources already used in compiling EGSS as is described in chapter “Methodology for compilation of EGSS T+15”. Created database of data sources contained information about data availability (i.e. when data are available for EGSS compilers) and also about time dimension to know, which data sources could provide data quarterly. Data sources, where quarterly data are provided on certain relevant variables, are shown in Table 7.

Table 7. List of data sources where certain quarterly data are available

Data sources	Variable	Data availability	Time dimension
Subsidies given by KredEx to apartment associations	Output	T+6	Day
Subsidies of Estonian Environmental Investment Centre	Output	T+3	Day
Subsidies of European Union Structural Funds	Output	T+1	Day
Export data of goods (preliminary data)	Export	T+3	Month
COFOG data from Public Sector Financial Statements	Output	T+0	Month
Number of vehicle technical inspections by enterprises	Output	T+0	Month
Output data from Public Sector Financial Statements	Output	T+0	Month
National accounts data from production account and generation of income account	Output, Value Added	T+9	Quarter
Export data of services (revised data)	Export	T+9	Quarter
Investments (P.51) by the type of investments and by NACE in national accounts	Output	T+9	Quarter
Employment data by NACE in national accounts	Employment	T+8	Quarter
Estonian Environmental Board data on expenditures made to control population of invasive species *Heracleum sosnowskyi*	Output	T+3	Quarter
Export data of services (preliminary data)	Export	T+3	Quarter
Construction statistics: floor area of dwellings and non-residental buildings according to the building permits	Output	T+2	Quarter
Price statistics: repair and reconstruction work price index	Output	T+1	Quarter
Changes in enterprises' activity according to the national accounts' rules	Output	T+29	not relevant
List of EGSS enterprises	Output	T+0	not relevant
Business register for statistical purposes	Output	T-2	not relevant

National accounts release certain key statistics quarterly such as investments, data from production account and generation of income account, aggregates on employment. But due to the lack of sufficient detailed data the quarterly aggregates contain estimations, which means that after revisions annual results and estimations can vary a lot. The same problem will occur with EGSS quarterly estimations and presumably even in a larger extent, because the market of EGSS in Estonia is small and for some EP and RM services and goods are very heterogenous. In sense of production EP and RM services and goods quite often form secondary activity and the production can be found in various economic activities.

Lacking sufficient detailed data on quarterly basis and also small and at the same time heterogenous market of EP and RM services and goods in Estonia are the reasons why the same methodology as applied for annual EGSS compilation cannot be used for the compilation of EGSS quarterly estimates. Output of only few EP and RM services and goods can be estimated on quarterly basis with sufficient quality. But the quality of the aggregates of the CEPA and CREMA categories is not feasible to achieve for quarterly estimates currently.

Data are rather partial, for or example production of renewable energy. Energy statistics releases some physical data on energy production monthly, collected by statistical questionnaire "Production and trade of energy, consumption of fuels (month)". So physical data on heat and electricity production from renewables are available even monthly. However, prices for production of heat and electricity from renewables are available only on an annual basis from annual energy statistics. Regarding the heat production from renewables, quarterly producer price index of heat production can be applied to make the estimations on quarterly prices for heat production from renewables. Quarterly producer price index of heat production does not distinguish that part of heat production which is produced from renewables however.

Different approach has to be taken with the price of electricity produced from renewables. As it is mentioned before the price for electricity produced from renewables is annual. Alternative data for having quarterly estimations on price of electricity produced from renewables are Nord Pool's data on market prices for electricity. Nord Pool is Europe's leading power market and offers trading, clearing, settlement and associated services in both day-ahead and intraday markets across 16 European countries (including Estonia). Average monthly electricity prices for Estonia can be easily derived from Nord Pool's homepage.

Another EGSS service, whose output might can be estimated quarterly, is energy efficient renovation. Data on funds of energy efficient renovation and data on square meters renovated can be provided on quarterly basis. Also, reconstruction work price index is released quarterly. So, quarterly renovation unit cost can be estimated when applying quarterly price index to annual renovation unit cost. Quarterly estimations and annual result regarding energy efficient renovation in 2021 are presented in Figure 3.

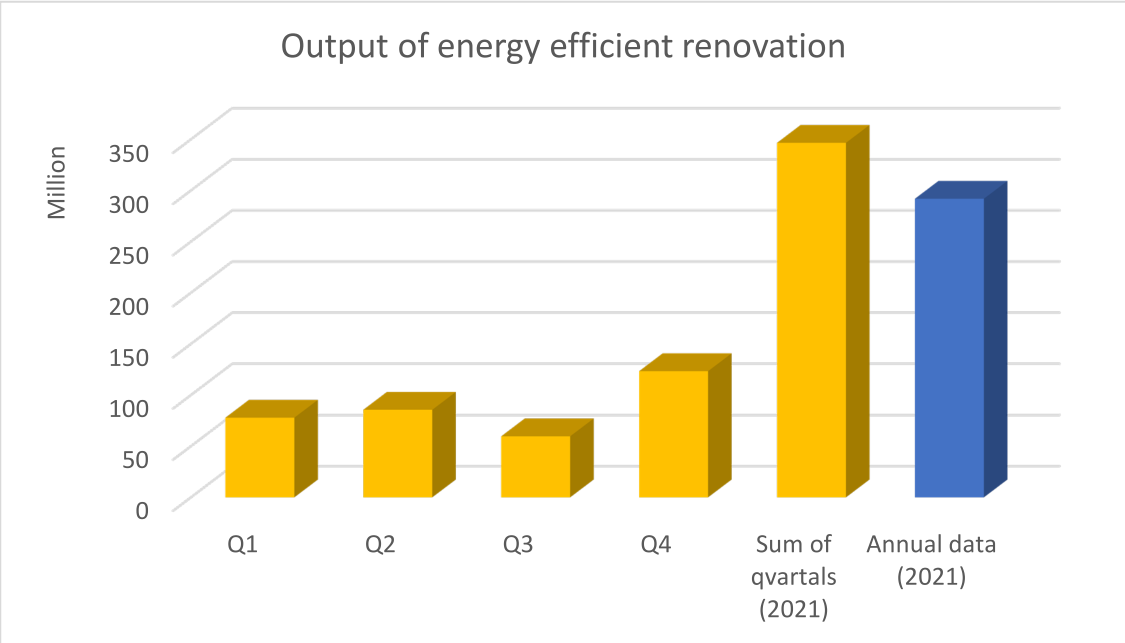

Figure 3. Output of energy efficient renovation according to quarterly and annual estimations, 2021

1.3 Methodology for compilation of EPEA T+15

Another task in the grant project in addition to earlier compilation of EGSS was to analyse if the compilation of EPEA T+15 would also be possible. The deadline for transmitting EPEA data to Eurostat is T+24 still earlier data would be of a great value to data users by providing with EGSS data complete information about the market of environmental services in Estonia – showing who has provided environmental services and who are the users and what is the environmental burden of different institutional sectors.

First step of this task was to analyse the availability of all data sources that are used to compile EPEA and develop alternative methodologies if some important data source would not be available in time.

Table 8 contains information of all the data sources that are necessary for the compilation of EPEA and when these become available. It is seen that all the data sources are available in order to compile

EPEA T+15. The biggest and most important data source for the compilation of EPEA is EGSS therefore the biggest bottleneck would arise when the compilation of EGSS would be delayed for some reason. In Estonia the compilation of EGSS and EPEA are done in parallel that means that some of the output calculations are done by the compiler of EPEA, the compilation of the accounts is combined, and the output of these accounts feed each other. That also means that although the final version of EGSS is set to be available T+15 it is possible to calculate necessary variables for EPEA a little earlier than T+15 in order to compile EPEA T+15. "Data availability" column in is filled using the information when the latest necessary data source for the compilation of first column "data sources" + approximate processing time would be available.

Table 8. List of data sources and data availability for the compilation of EPEA

Data sources	Data availability	Time dimension
Market output of environmental services from EGSS	T+14	Year
Non-market output of environmental services from EGSS	T+12	Year
Ancillary output of environmental services from EGSS	T+13	Year
Households final use of waste and wastewater treatment services from NA	T+9	Quarter
Expenditures of general government by COFOG from government statistics	T+12	Year
Environmental protection expenditures survey data (non-specialised producers)	T+10	Year
Environmental protection expenditures survey data (specialised producers)	T+13	Year
Output from EGSS that are considered as investments in EPEA	T+13	Year
Export of environmental services from EGSS	T+9	Year
Import of environmental services from foreign trade statistics	T+9	Quarter
Monetary supply and use table from NA	T+29	Year
Data from production account and generation of income account	T+9	Quarter
Funds of Estonian Agricultural Registers and Information Board	T+5	Year
Funds of Estonian Environmental Investment Centre	T+3	Day
Funds of European Union Structural Funds	T+1	Day
Investments (P.51) by the type of investments and by NACE in national accounts	T+9	Quarter

Market output of environmental services from EGSS covers following environmental services: waste and wastewater treatment, measurement of exhaust gases of vehicles, protection of semi-natural landscapes, miscellaneous EP services provided by enterprises and general government, replenishment of fish stocks, control of invasive fauna and flora, research and development, construction services for fish passages.

Non-market output of environmental services from EGSS covers some of the services that are also used for market production but are done by non-market producer and some additional services: miscellaneous EP services provided by general government and non-profit institutions serving households, waste and wastewater treatment, protection of semi-natural landscapes, research and development, replenishment of fish stocks, control of invasive fauna and flora.

Output from EGSS that are considered as investments in EPEA covers various construction activities: construction services for waste and wastewater treatment plants, construction services related to protection of ambient air, remediation of soil pollution, construction of noise barriers and non-motorized roads. Also other data sources are used to calculate total value of environmental investments – expenditures of general government and environmental protection expenditures survey of ancillary environmental activity and expenditures of specialized producers that uses enterprises` investments data from SBS survey EKOMAR and annual business reports as important data sources. Availability of EKOMAR and business reports are described in previous paragraph under Methodology for compilation of EGSS T+15.

Various outputs from EGSS are necessary to calculate the use side of environmental services. The logic that all services that are produced have been used is used in the compilation of EPEA. Availability of data sources to calculate output of services from EGSS are also discussed in previous paragraph under Methodology for compilation of EGSS T+15.

1.3.1 Results of EPEA T+15

Using data sources and calculation formulas that are used to produce EPEA T+24 it was calculated that preliminary National expenditure on environmental protection (NEEP) in 2021 was 634.3 million euros. The biggest share was made in waste management service (49% from total value) and wastewater management service (22% from total value). Shares of all CEPA categories can be seen on Figure 4.

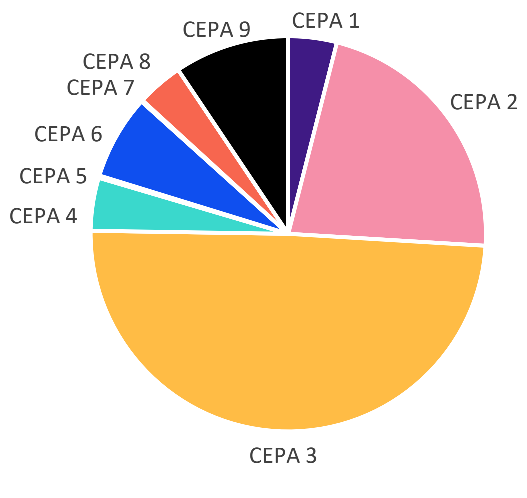

Figure 4. Share of national expenditure on environmental protection by CEPA categories, 2021, %

The preliminary 2021 NEEP value is slightly smaller than in 2020 also the share from GDP is smaller (2% in 2021 and 2,3% in 2020). Time series of NEEP value and share from GDP is seen on Figure 5. As national accounts revise their data in September the final NEEP value might change by the end of October when EPEA data has to be transmitted to Eurostat as NA is one of the data sources for EPEA compilation. National Accounts revises their data until monetary supply and use tables (SUT) are compiled. That means, that also EPEA value changes until SUT is ready. In 2023 SUT of 2019 is available and 2019 EPEA data are final, other years (2020 and 2021) would be revised in coming years.

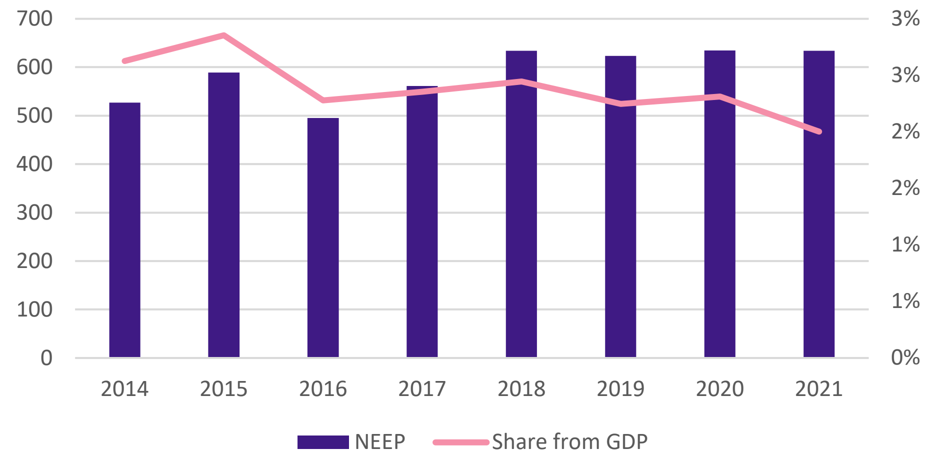

Figure 5. National expenditure on environmental protection and share from GDP, 2014-2021, million euros

When comparing different categories of NEEP, it is seen that although intermediate and final use of environmental protection services in 2021 was larger (574.9 million euros in 2021 and 547.3 million euros in 2020) than in previous years then environmental investments were smaller (123.4 million euros in 2021 and 134.5 million euros in 2020) and transfers received from rest of the world were larger in 2021 (64 million euros) compared to 2020 (46.9 million euros). Investments were smaller due to acquisition less disposal of non-produced assets (revenue from selling land) of general government under COFOG 05 were large in 2021 and exceeded gross fixed capital formation therefore total environmental investments value of general government was negative. Also transfers data are not final yet and will be revised before reporting in October. As the methodology for compiling ESST was done as another task in this grant project then possible revision in transfers data in EPEA are also possible in the next data transmission to Eurostat. Values of different NEEP categories can be seen in Figure 6. Transfers are negative in the figure due to transfers from rest of the world has to be subtracted to calculate NEEP value.

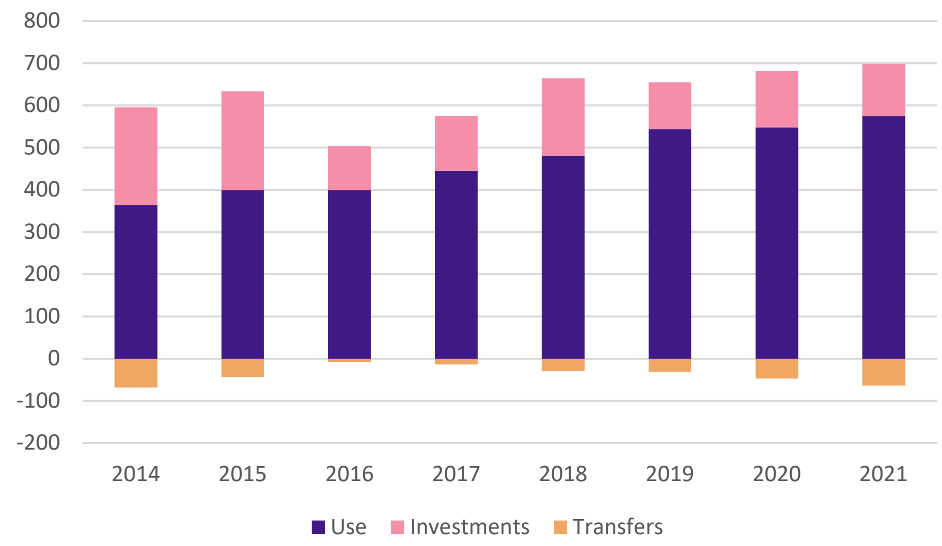

Figure 6. Values of different categories of NEEP, 2014-2021, million euros

As all data sources are available in time to produce EPEA earlier probably the most important step to produce EPEA T+15 would be developing regular workflow that is combined with the workflow to produce EGSS data.

Another discussion point arises – as environmental subsidies and transfers (ESST) account covers transfers data in EPEA and should be used as a data source for EPEA then the compilation of ESST should also be done before T+15 in order to calculate NEEP value. The possibility to compile ESST earlier than it is compulsory has not been analysed yet. One suggestion is that in order to compile EPEA T+15 preliminary transfers data would be used and when ESST data are available then revised EPEA could be compiled. But in order to lessen potential workload then the possibility to compile earlier ESST data would be necessary to analyse and develop.

All compulsory variables were filled in Eurostat data transmission questionnaire that is added to grant project. 2022 questionnaire was taken as the bases to fill the data of 2021 as 2023 questionnaire has not been received yet.

2 Improving the granularity of EGSS

2.1 Overview

The production of energy from renewable resources has been increasing and becoming more important year by year. The objective of the work is to gain more granular information regarding renewable energy products and services to enhance the quality and usability of the data as accounts would be compiled on a more policy relevant level. The increased granularity of EGSS includes splitting renewable energy by energy resource. Developed methodology was also consulted on virtual meetings with consultants from Statistics Netherland.

2.2 Methodology

Detailed data by enterprises from energy statistics and big data by Elering for producers of solar power is used to calculate EGSS production of electricity and heat from renewable sources. The data includes information of the produced electricity or heat and the source these are generated from but in the current methodology the information is solely used for distinguishing between energy produced from renewable and non-renewable sources. Thus, the same data as is currently used for calculating EGSS production was used for the task at hand and additional dimension of energy source was added.

The necessary data (electricity and heat separately) were extracted from main datasets (electricity and heat separately) that included information on enterprises and their activity code, physical quantity of produced energy by each energy source and already calculated respective monetary EGSS production, including division between market and ancillary production. More granular data was compiled for year 2021.

Table 9 shows the production of electricity from renewable sources in 2021 by activity and energy source. Table 10 shows the production of heat from renewable sources in 2021 by activity and energy source. Heat produced from biogas was solely used for own use, heat produced in CHP (combined heat and power) was not included.

Division into market and ancillary production for heat and electricity can be found in accompanying Excel file ”D1_3_ Dataset on more granular supply and use tables of renewable energy 101022852_2020-EE-ENVACC”.

Table 9. Production of renewable electricity by activity and energy source, 2021, million euros

NACE	Biogas	Hydro	Waste	Black liquor	Landfill gas	Wood	Wind	Solar	Total
A 01								1.883	1.883
A 02								0.315	0.315
A 03								0.022	0.022
B 05 - B 09								0.013	0.013
C 10 - C 12								0.146	0.146
C 13 - C 15								0.031	0.031
C 16								0.442	0.442
C 17				0.000		3.042		0.008	3.049
C 18								0.027	0.027
C 19									
C 20								0.028	0.028
C 21									
C 22								0.023	0.023
C 23								0.060	0.060
C 24									
C 25								0.116	0.116
C 26									
C 27								0.029	0.029
C 28								0.027	0.027
C 29								0.012	0.012
C 30								0.041	0.041
C 31 - C 32								0.092	0.092
C 33							0.120	0.021	0.141
D 35	1.335	1.082	12.078		0.062	160.313	50.241	20.034	245.146
E 36								0.048	0.048
E 37 - E 39					0.042			0.027	0.068
F 41 - F 43		0.080						0.986	1.065
G 45								0.101	0.101
G 46								0.647	0.647
G 47								0.138	0.138
H 49								0.082	0.082
H 50								0.000	0.000
H 51									
H 52								0.026	0.026
H 53								0.066	0.066
I 55 - I 56								0.136	0.136
J 58								0.000	0.000
J 59 - J 60								0.001	0.001
J 61								0.019	0.019
J 62 - J 63								0.047	0.047
K 64								0.025	0.025
K 65									
K 66								0.002	0.002
L 68								0.944	0.944
M 69 - M 70								0.383	0.383
M 71								0.100	0.100
M 72								0.096	0.096
M 73								0.001	0.001

M 74 - M 75								0.018	0.018
N 77								0.026	0.026
N 78								0.004	0.004
N 79								0.001	0.001
N 80 - N 82								0.109	0.109
O 84								0.069	0.069
P 85								0.021	0.021
Q 86								0.014	0.014
Q 87 - Q 88								0.023	0.023
R 90 - R 92								0.006	0.006
R 93								0.022	0.022
S 94								0.054	0.054
S 95								0.002	0.002
S 96								0.192	0.192
Total	1.335	1.162	12.078	0.000	0.104	163.355	50.361	27.805	256.200

Table 10. Production of heat from renewable sources by activity and energy source, 2021, million euros

	Biogas		Wood		Total	
NACE	Production (MWh)	Production (million euros)	Production (MWh)	Production (million euros)	Production (MWh)	Production (million euros)
A 01			5 451.50	0.18	5 451.50	0.18
C 10_11	3 633.00	0.00	33 100.00	1.80	36 733.00	1.80
C 13_15			12 517.00	0.68	12 517.00	0.68
C 16			1 112 056.37	60.53	1 112 056.37	60.53
C 17			195 128.00	10.62	195 128.00	10.62
C 20	597.00	0.00			597.00	0.00
C 25			2 794.90	0.15	2 794.90	0.15
C 26			27.00	0.00	27.00	0.00
C 30			808.00	0.04	808.00	0.04
C 31_32			27 719.54	1.51	27 719.54	1.51
D 35			931 576.20	49.27	931 576.20	49.27
E 36	12 845.00	0.00	32 348.00	1.69	45 193.00	1.69
E 37_39	125.00	0.00			125.00	0.00
F 41_43			3 380.00	0.18	3 380.00	0.18
G 45			369.00	0.02	369.00	0.02
G 47			809.60	0.04	809.60	0.04
H 49			41.00	0.00	41.00	0.00
I 55			3 390.00	0.18	3 390.00	0.18
L 68			7 970.00	0.29	7 970.00	0.29
O 84			46 634.80	0.92	46 634.80	0.92
Q 87_88			359.00	0.00	359.00	0.00
Total	17 200.00	0.00	2 416 479.91	128.12	2 433 679.91	128.12

EGSS includes only supply of the goods and services and not the use part, therefore in the work it was focused on producing more granular data on supply of renewable energy. Regarding estimating the use, available data was analysed. Energy statistics includes data on sold electricity and heat divided between enterprises, households and vendors. Significant share is sold to vendors and there the direct link between energy produced from a known source and the user disappears, making estimating the use even by institutional sectors difficult. Results for the use of electricity by renewable energy source and institutional sector are in Table 11. Results for the use of heat by renewable energy source and institutional sector are in Table 12. The results are displayed also in in accompanying Excel file "D1_3_ Dataset on more granular supply and use tables of renewable energy 101022852_2020-EE-ENVACC".

Alternative way is to use shares which is similar to methods applied for calculating the consumption of electricity and heat produced from renewable sources. However, more granularity regarding the source of the energy would require many assumptions. In addition, it is important to note that the input data for calculating the consumption of electricity and heat produced from renewable sources carried out under task 'expanding EPEA with resource management' (chapters 3.8 and 3.9 respectively) is different from data used in EGSS.

Table 11. Consumption of electricity from renewable sources, 2020, million euros

Institutional sector	Consumption of electricity from renewable sources, 2020, million euros								
	Biogas	Hydro	Waste	Black liquor	Landfill gas	Wood	Wind	Solar	Total
Enterprises S.11									
General government S.13									
Households S.14									
NPISH S.15									
Total	1.335	1.162	12.078	0	0.104	163.355	50.361	27.805	256.2

Table 12. Consumption of heat from renewable sources, 2020, million euros

Institutional sector	Consumption of heat from renewable sources, 2020, million euros		
	Biogas	Wood	Total
Enterprises S.11			
General government S.13			
Households S.14			
NPISH S.15			
Total	0	128.12	128.12

3 Expanding EPEA with resource management products and environmental protection goods in Estonia

3.1 Overview

Expenditure of environmental products like electric vehicles and renewable energy for example are becoming more and more important. Although these products are included in the EGSS, they are not in scope of the EPEA which considers only the expenditure on environmental protection services.

One of the objectives for the improvement of the statistics in the area of EPEA and EGSS was expanding EPEA with resource management products and environmental protection goods in Estonia.

EPEA was extended with the list of relevant resource management and environmental goods - this was to get a better overview of the market for these goods. From an innovative aspect, an attempt is made to compose supply and use tables for products evaluated in this grant. Goal of this sub task of a grant project was to calculate the use of several environmental protection and resource management goods in monetary value.

Products considered for this project were chosen from EGSS compendium, the implementing regulation (EU) 2015/2174. Also the products that were not eventually included in the calculations and covered in this report are analyzed and described the in the chapter "List of products considered for this grant", along with reasons concerning each product. Initial list of ReMEA products was consulted with Estonian Ministry of Environment and other stakeholders, in addition also with the experts of Statistics Netherlands. Methodologies were mainly consulted on virtual meetings.

Consultations were held to determine the interest of stakeholders and available information for products under review. Final decision to include or exclude products were based on the data available. Lack of up to date, detailed enough and accurate data remained a problem throughout this project.

Full cost and extra cost were calculated to illustrate consumption of environmental goods for certain goods. Net stock, consumption of fixed assets and changes in inventories were not analyzed. For products observed in this grant project, supply, use and extra cost tables were compiled. Developed methodology is described and it was also assessed by the experts of Statistics Netherlands and the part of the remaining issues and questions was also compiled. Dataset on supply and use of selected products will be delivered to Eurostat along with this report at the end of the grant project.

3.2 List of products considered for this grant

The list of products considered for this area of work is discussed in this chapter. Large number of the products initially chosen were not evaluated in monetary terms for various reasons. Main reasons being lack of data or data being too aggregated. Series of consultations were held with representatives from Estonian Ministry of Environment, Ministry of Agriculture and other stakeholders. During those consultations a list of products was presented to the panel to gather feedback. This feedback was then used to clarify the stakeholders' interest in certain products and to determine useful contacts and datasets. Several products were also deemed not relevant by local experts, as they are not produced nor commonly used in Estonia.

Products chosen for evaluation in this grant project include:

- electric and more resource efficient transport equipment
- septic tanks
- waste containers
- organic food
- organic agricultural goods
- electricity from renewable sources
- heat from biogas
- solar panels
- boilers for burning wood
- fluorescent lamps (CFL) and most efficient domestic appliances
- heat pumps
- low energy and passive buildings

List of products that were not evaluated further in monetary terms are presented in Table 13 with CEPA/CREMA category along with a short comment.

Table 13. List of products considered for this grant project, but not chosen for further evaluation

Product	CEPA/CREMA	Comment
Instruments, machinery and apparatus for filtering or purifying gases and liquid	CEPA 1	Flows not separable in consumption. No data.
Instruments, machinery and apparatus for analysis of pollutants	CEPA 1	Flows not separable in consumption. No data.
Exhaust pipes and their parts (also particles filters)	CEPA 1	Flows not separable in consumption. No data.
Electric and more resource efficient transport equipment: charging stations	CEPA 1	No data.
Perforated buckets and similar articles used to filter water at the entrance to drains	CEPA 2	Flows not separable in consumption. No data.
Pumps for use in wastewater treatment	CEPA 2	Costs covered in intermediate consumption.
Activated carbon for water filtering purposes	CEPA 2	Flows not separable in consumption. No data.
Vehicles for wastewater treatment, vehicles for sewer cleaning, trucks for waste collection	CEPA 2	Costs covered in intermediate consumption.
Tubes and pipes for wastewater treatment plants as well as for water management	CEPA 2	Costs covered in intermediate consumption.
Sacks and bags for replacing plastic bags; bio-plastic sacks and bags bins; boxes, containers and other receptables for storing and transporting waste	CEPA 3	Flows not separable in consumption. No data.
Boards, blocks and similar articles of vegetable fiber, straw or wood waste, agglomerated with mineral binders	CEPA 3	Flows not separable in consumption. No data.
Incinerators and machinery for waste treatment (e.g. used at landfilling sites)	CEPA 3	Flows not separable in consumption. No data.
Goods for thermal and noise insulation mainly in buildings: windows with three insulation layers	CEPA 5	Flows not separable in consumption. No data.
Goods for thermal and noise insulation mainly in buildings: insulation materials for facades, roofs, and other elements of buildings such as materials made of glass fibre, rock wool, cellulose, polymers and polyurethane and others (e.g. autoclave cellular concrete)	CEPA 5	Flows not separable in consumption. No data.
Goods for thermal and noise insulation mainly in buildings: cork products	CEPA 5	Flows not separable in consumption. No data.

Organic aquaculture products	CEPA 6	No data on organic aquaculture products consumed.
Lead containers for radioactive waste	CEPA 7	Not relevant.
Specific equipment produced for environmental protection and resource management products: Instruments and apparatus for measuring or detecting ionising radiations	CEPA 7	Flows not separable in consumption. No data.
Reconditioned wooden containers	CREMA 11B	Data currently being gathered by Environmental Agency. Evaluation possible for future projects.
Specific equipment for the production of energy from renewable sources: wind turbines	CREMA 13A	No data.
Specific equipment produced for environmental protection and resource management products: solar water heaters	CREMA 13A	Not relevant.
Specific equipment for the prodcution of energy from renewable sources: storage systems for biogas made from high tech textiles	CREMA 13A	Not relevant.
Specific equipment for the production of energy from renewable sources: hydraulic turbines and water wheels	CREMA 13A	No data.
Charcoal when complying with sustainability measures	CREMA 13A	No data.
Specific equipment produced for environmental protection and resource management products: thermostats for heating and cooling regulation	CREMA 13B	Flows not separable in consumption. No data.
Specific equipment produced for environmental protection and resource management products: thermostatic valves	CREMA 13B	Flows not separable in consumption. No data.
Specific equipment produced for environmental protection and resource management products: condensing boilers	CREMA 13B	Flows not separable in consumption. No data.
Reclaimed rubber in primary forms or in plates, sheets or strip	CREMA 13C	Not relevant.
Machinery for metal recovery	CREMA 14	Flows not separable in consumption. No data.
Construction materials (aggregates)		Proposed by ministry. Data too aggregated. Unable to fit in to scope.

3.3 Methodology for calculating the consumption of electric and more resource efficient transport equipment

In this chapter we look at the use of electric vehicles (EV) and petroleum-electric hybrid vehicles (HEV). More specifically we are focusing on passenger cars (M1, M1G) and vans (N1, N1G). The vehicles in question must meet the EURO 6 emission standards, as decided in a discussion with Eurostat. Only plug-in hybrid vehicles (PHEV/OVC HEV) are represented in the hybrid vehicles category. So called “mild-hybrids (MHEV/NOVC HEV)” have been excluded on the grounds of their efficiency and emission benefits being rather small and they are not classified as “clean vehicles” in Eurostat guidelines. For that, data from Estonian Transport Administration was used. Data from Environmental Investment Center (EIC) was used to determine the shares of EV-s and HV-s between institutional sectors. At first, supply and use tables were compiled using national accounts SUT data from 2014-2018. However, this provided slightly skewed results – EV-s and HV-s are typically not bought and used by enterprises (S.11) due to their price and characteristics – for example, in the field of logistics and construction, vehicles with internal combustion engine (ICE) are preferred because of their cheaper price and maintenance.

Compared to the results of previous grant project in 2016, the last time an attempt was made to survey the use of EVs and petrol-electric/diesel-electric vehicles in Estonia, the sales of EV-s and hybrid electric vehicles have increased significantly – in 2020 there were roughly 10 times more new EVs registered than in 2016 (Table 14). According to the data obtained from Estonian Transport Administration, there were 34 new EV-s registered in 2016. In 2020 there were 344 passenger EV-s registered. In addition, 15 fully electric vans were registered.

Table 14. New electric vehicles registered in 2016 and 2020 comparison

New EVs registered in 2016	34
New EVs registered in 2020	359

The extra cost of electric vehicles (EV) and plug-in hybrid vehicles (PHEV) was based on the price difference of EV/PHEV compared to their conventional, internal combustion engine (ICE), counterpart (Table 15). In case there was no direct ICE match for EV and/or hybrid vehicle from the same brand, a vehicle from same segment and with similar characteristics, was chosen from a different brand. Prices for the new EVs/ICE vehicles were taken from dealerships websites. The formula for calculating extra cost was *(EV price*vehicles sold)-(ICE price*vehicles sold) = extra cost*. In case of EV being cheaper than its ICE counterpart, the cost of EV counts towards *full cost*, but not *extra cost*. There was no need to add trade and transport margins and VAT as the prices on dealerships websites already include them. For S.11, VAT had to be deducted from the purchaser price.

Table 15. Full cost of conventional ICE vehicles, EVs and extra cost of EVs in 2020, purchaser price, with EVs cheaper than ICE counterpart excluded

Full cost conventional ICE vehicles, million euros	13.40
Full cost of Electric Vehicles, million euros	18.10
Extra cost of Electric Vehicles, million euros	5.10

Purchasing used EV-s has also increased by a great number – going up from 17 EV-s registered in 2016 to 118 EV-s in 2020. Three fully electric vans were also bought as used. In this report, however, we do not calculate the cost and extra cost of used vehicles because: a) prices and price difference of used vehicles are largely based on estimation and therefore highly inaccurate, and b) possibility of double counting the investment.

For hybrid vehicles making a comparison between 2016 and 2020 gets a bit more complicated. Statistics for 2016 don't tell the difference between MHEVs (mild-hybrids) and PHEVs (plug-in hybrids). As such, the data about 2016 and 2020 will not offer a direct comparison, but it can be used to offer some background information (Table 16).

In 2016, total of 764 new hybrid vehicles were registered. Year 2020 saw 2847 new hybrid vehicles registered, of which 119 were PHEVs.

Table 16. New hybrid electric vehicles registered in 2016 and 2020 comparison

New hybrid vehicles registered in 2016	764*
New plug-in hybrid vehicles registered in 2020	119

*includes so called "mild-hybrids" that were excluded from 2020 statistics

In 2016, 239 used hybrid vehicles were registered. In 2020 512 used hybrid vehicles were registered, of which 103 were PHEVs. As with EVs, we do not calculate the cost and extra cost of used vehicles because: a) prices and price difference of used vehicles are largely based on estimation and therefore highly inaccurate, and b) possibility of double counting the investment.

Prices for the new PHEVs/ICE vehicles were taken from dealerships websites. The formula for calculating extra cost was *(PHEV price*vehicles sold)-(ICE price*vehicles sold) = extra cost*. In case of PHEV being cheaper than its ICE counterpart, the cost of PHEV counts towards *full cost*, but not *extra cost* (Table 17).

Table 17. Full cost of conventional ICE vehicles, PHEVs and extra cost of PHEVs in 2020

Full cost of conventional ICE vehicles, million euros	6.80
Full cost of PHEV, million euros	7.50
Extra cost of PHEV, million euros	0.80*

*PHEVs cheaper than ICE counterpart excluded

In the future the same methodology could be used. Data from Estonian Transport Administration is available for the number of electric/PHEV vehicles registered. With the range of EVs and PHEVs offered by manufactures increasing each year, complying the price list gets more time consuming but also more inaccurate. As many manufactures are dropping ICE vehicles completely from their segments, it is impossible to make direct price comparison between EV/PHEV and ICE vehicles.

Further discussion is need as to determine which type of vehicles are to be considered environmentally friendly in the future. In discussion with representatives from Estonian Ministry of Environment the environmental benefits of PHEVs were discussed. A study focused on the use of PHEVs in Estonia concluded, that as with “mild-hybrids”, the environmental benefits of plug-in hybrids are negligible. This comes down to the fact, that many PHEV users let the hybrid battery run dry and continue using their PHEVs as normal ICE vehicles. Therefore, plug-in hybrids are not considered as an environmentally friendly product by Ministry of Environment in Estonia.

3.4 Methodology for calculating consumption of septic tanks

Consumption of septic tanks was analyzed in previous grant project and was reconsidered in the project. It was agreed that the previously developed methodology can be applied also in this project. Description of the methodology follows.

The use of septic tanks is common in rural parts of Estonia and in some cases even in cities. In this chapter we examine the consumption and export of septic tanks described as reservoirs, tanks, vats and similar containers, capacity > 300 l, of plastics. The results are displayed in Table 18.

First, the EGSS producers list was analyzed to identify the producers of said products. Annual business reports of the producers were examined to determine the production share of septic tanks. In case annual reports were not detailed enough, producers were contacted directly to obtain accurate data. To determine the export and import, foreign trade statistics was used. Consumption of septic tanks was allocated to households (S.14) due to lack of better assessment.

Table 18. Consumption and export of septic tanks in Estonia, 2020, million euros, purchaser price

Consumption, million euros	15.23
Export, million euros	2.34

Calculations were based on the assumption that consumption = production. Therefore, production + import + trade and transport margins + VAT calculation was used. Trade and transport margins were taken from Statistics Estonia database "trade enterprises' assets, liabilities and trade margin by economic activity" and VAT rate in Estonia is 20%. The same methodology was used in previous grant project and was described in the final report. The methodology was then approved by Statistics Netherlands and a local expert in this field.

It is possible to calculate the use of septic tanks annually using this methodology as data is available from enterprises annual business reports. However, in most cases the business reports are too aggregated, and producers need to be contacted directly to clarify the sales and production share of septic tanks. This may not yield a satisfying result, as each producer must be approached individually, and they have no legal obligation to share data on their production or sales. It was not possible to determine the use of septic tanks by institutional sector. This is because septic tanks are not distinguishable in SUT tables and there was no expert opinion available to evaluate the use of septic tanks by institutional sector.

3.5 Methodology for calculating consumption of waste containers

Consumption of waste containers was analyzed in the previous grant project and was reconsidered in current project. It was agreed that the previously developed methodology can be applied also in this project. Description of the methodology follows.

First EGSS producers list was examined, and all the waste management companies were contacted to calculate consumption of waste containers in Estonia (Table 7). Unfortunately, no information was shared by the waste management companies and analyzing the annual business reports of the producers from EGSS list did not yield the desired information. As such, this chapter is based on one waste management company annual business report and import data from one waste containers distributer. Allocations by institution are based on the previous grant project - one waste management company provided data on consumption by institutional sector (Table 19). In discussion with representatives from Estonian Ministry of Environment it was decided to use same allocation shares in this grant project for enterprises (S.11), households (S.14) and NPISH (S.15) as they believe the market is stable and there has not been any significant changes to the market in recent years. For 9% of the sales there was no data about institutional sector. This was divided equally between the three known sectors when calculating the consumption in euros.

Table 19. Consumption of waste containers by institutional sector in 2020, percentage

Sector	Share, %
Enterprises S.11	31
Households S.14	40
NPISH S.15	20
No data	9

For calculating the consumption of waste containers in euros (Table 20), the following calculation was used: import + trade and transport margins + VAT. Trade and transport margins were taken from Statistics Estonia database “trade enterprises' assets, liabilities and trade margin by economic activity” and VAT rate in Estonia is 20%. For enterprises VAT was not added.

Table 20. Consumption of waste containers by institutional sector in 2020, million euros, purchaser price

Sector	Consumption, million euros
Enterprises S.11	0.21
Households S.14	0.32
NPISH S.15	0.17
TOTAL	0.70

Using EGSS producers list and annual business reports to evaluate the consumption waste containers has many shortcomings. Each company producing and selling waste containers must be contacted individually to obtain accurate data on sales and allocation by sector. As seen in this chapter, companies are not willing to share this information. Neither is it possible to use foreign trade statistics to identify importers of waste containers, as the trade statistics are not detailed enough. Therefore, this whole chapter relies on annual business report of a single identified distributer of waste containers and data from previous grant project. This can lead to highly inaccurate results and possibly a gross underestimation of consumption of waste containers. As such, this methodology is rather weak and needs to be improved.

3.6 Methodology for calculating consumption of organic food

Consumption of organic food was analyzed in previous grant project and was reconsidered in current project. It is largely based on the same methodology as in the previous grant project, apart from some data being already available from different sources, therefore directly contacting local producers was not necessary. Products relevant in this chapter are such as ready-to-eat meals, baby food, fruits and vegetables, processed fruits and vegetables (snacks, jam, juice, etc.), sweets and spices.

To calculate the consumption of organic food, data from Estonian Institute of Economic Research (EIER) and Statistics Estonia was used. Data from EIER consisted of prices, market share, export and import and *full cost* of organic food. Statistics Estonia provided data on retail and consumption of food. Consumption was divided between different sectors based on SUT data (Table 22).

To calculate price difference for consumption of organic and non-organic products pricing data from EIER was used. Based on Statistics Estonia yearly household consumption data, appropriate consumption shares were assigned for each product. The results revealed that organic food is ~44% more expensive, compared to non-organic food. In 2020 consumption of organic food in Estonia was 76.50 and export was 15.57 million euros (Table 21), making the total use 92.07 million euros and extra cost of 41.18 million euros. There was no need to add trade and transport margins nor VAT, since they were already included in the retail price. However, margins and VAT were calculated to determine the producer price in supply table.

Table 21. Consumption of organic food in Estonia, 2020, million euros, purchaser price

Consumption of organic food, full cost, million euros	76.50
Export of organic food, million euros	15.57
Consumption of organic food, extra cost, million euros	41.18

Table 22. Consumption of organic food in Estonia by institutional sector, 2020, million euros, purchaser price

Sector	Consumption, %	Consumption, million euros
Enterprises S.11	23	17.60
General Government S.13	1	0.80
Households S.14	76	58.10
NPISH S.15	0	0.00

This methodology could be used in the future, provided that EIER continues to gather data on organic and non-organic food consumer prices. For certain food products, the data is too aggregated (for example vegetables) and consumption of specific products (e.g., cabbage, onion etc.) had to be estimated. This methodology could be improved when it is possible to get even more detailed data from Statistics Estonia household consumption database.

3.7 Methodology for calculating consumption of organic agricultural goods

For this grant project an attempt was made to calculate the consumption of organic agricultural goods. These are the products that fall out of “organic food” category. These are mainly livestock and grain, but to some extent, horticultural crops. Such horticultural crops were sold to retailers or food processors.

According to EGSS, the economic value of organic agricultural goods produced in 2020 was 88.9 million euros, of which estimated export was 20.6 million euros. Export data from previous years was used to estimate the export value for 2020. This data was provided by Ministry of Rural Affairs in collaboration with Estonian Institute of Economic Research (EIER). However, there is no data available for import and our contacts did not suggest a reliable methodology to determine import share. Therefore, an assumption was made that 2% of organic agricultural goods were imported (Table 23). For that, foreign trade statistic was studied and country of origin for agricultural goods was identified. After studying the organic agricultural production of those countries, where such data was available and made public, it was decided to use 2% as an import value. In addition, “Market analysis of organic foods in the Nordic and Baltic countries” by Norden was studied to understand the trade and production profile of organic agricultural goods in Estonia and its trading partners. Trade and transport margins and VAT were calculated to determine the producer price.

Table 23. Export and import of organic agricultural goods in Estonia, 2020, million euros

Export of organic agricultural goods	20.63
Import of organic agricultural goods	1.32

Based on national accounts SUT, all consumption of organic agricultural goods was allocated to S.11 enterprises, consumption by S.14 households was less than 0.0 percent (Table 24).

Table 24. Consumption of organic agricultural goods by sector, 2020, percentage

Sector	Consumption, %
Enterprises S.11	100
General Government S.13	0
Households S.14	0
NPISH S.15	0

Since there was no other data available to make extra cost calculations, subsidies allocated to organic farming was used you determine the extra cost for organic agricultural goods. This was 19.95 million euros in 2020 (Table 25).

Table 25. Consumption of organic agricultural goods in Estonia, 2020, million euros, purchaser price

Consumption of organic agricultural goods, full cost, million euros	88.90
Consumption of organic agricultural goods, extra cost, million euros	19.95

3.8 Methodology for calculating consumption of electricity from renewable sources

As a first step to calculate the monetary value of the use of electricity produced from renewable sources it was necessary to evaluate sold electricity in physical units (Table 26). Own consumption of electricity producers was also included in the calculations.

To find the electricity sold to the grid in physical by energy source, the data from Elering was used. Elering is an independent electricity and gas transmission system operator in Estonia. In 2016 an attempt was also made to calculate sold amounts of electricity using data of paid renewable energy subsidy, however it was found that the approach was not sustainable as one of the criterions to apply for the subsidy is the time (max 12 years) of producing electricity from renewables. Own consumption of electricity producers was found from energy statistics, where it is reported.

In order to evaluate consumed electricity from renewable sources, it was also necessary to calculate export and import of electricity from renewable sources.

For calculating export, an assumption was made that the share of exported electricity from total electricity was the same for electricity produced from renewable sources. The share was available from energy statistics. In 2020 66% of electricity was exported. When using the same share, then 1693 GWh of electricity from renewables was exported in 2020. In 2016 the share of exported electricity from all the electricity given into the grid was 54% and the amount of exported electricity from renewables was 793 GWh.

Data from the Association of Issuing Bodies (AIB) regarding European Residual Mixes 2020 were used in order to evaluate the amount of imported electricity from renewable sources. According to AIB report 16% of electricity from renewable sources was imported to Estonia in 2020. Using the share, it can be calculated that 1181 GWh of renewable electricity was imported in 2020. In 2016 the share of imported electricity from renewables was 13% and the amount of imported electricity from renewables was 505 GWh. For more details see Annex.

In 2016 when the methodology was first developed, colleagues in Statistics Netherlands were rather reluctant in using AIB as a data source for imported electricity from renewables, however Eurostat was not against it and national experts supported the choice to use it as a data source.

In order to calculate the total amount of consumed electricity from renewable sources export had to be subtracted and import added to the amount of sold and own consumed electricity. Total amount of consumed renewable electricity in 2020 was 2048 GWh. In 2016 it was 1 185 GWh.

Table 26. The amount of sold, consumed for own use, exported and imported electricity from renewable sources in 2020, GWh

Source of electricity	Electricity given into the grid	Own consumption	Export	Import	Total consumption
Biogas	29	11			
Biomass (including waste)	1231	298			
Wind	824				
Hydro	27	0.1			
Solar	119	20			
Total	2230	330	1693	1181	2048

Next step was to distribute the use of electricity between users. The distribution between consumers was based on use of the product P26 Electrical energy in Physical energy flow accounts (PEFA) which includes sold and own-consumed quantities. The latest available accounts were compiled for 2019 and therefore data for 2019 were used. It was found that the intermediate consumption of corporations was ca 74%, final consumption of households was 21%, final consumption of general government was ca 5% and NPISH 0.02%. Previously using the distribution in supply-use tables (SUT) in National Accounts was also considered but following the suggestions of colleagues in Statistics Netherlands it was found that using physical data instead of monetary data would be more precise.

After the distribution of the use of renewable electricity between institutional sectors it was necessary to calculate the price of electricity. Electricity prices by type of users were available from Statistics and these include all additional fees- network service fee (26% of electricity bill in average), electricity excise (3.8%) and renewable energy charge (9%), except for VAT that is additional 16.7% in average. The average price of electricity for medium size households was 105 euros/MWh and for medium size industries 85 euros/MWh in Estonia in 2020.

According to electricity operators electricity from renewables was 1.7% more expensive than electricity produced from nonrenewable sources. It was calculated that the whole extra cost of renewable electricity was 3.57 million euros in 2020, in 2016 it was 4.2 million euros. In Table 27 full and extra cost of renewable electricity by institutional sectors in 2020 are presented.

Table 27. Full cost and extra cost of electricity from renewable sources by institutional sectors in 2020, million euros

Institutional sector	Full cost of electricity	Extra cost of renewable electricity
Enterprises S.11	152.49	2.51
General government S.13	10.28	0.17
Households S.14	54.05	0.89
NPISH S.15	0.05	0.001
Total	216.86	3.57

This methodology is applicable also in the future as all the data sources would be available.

Additionally, the supply of energy from renewable sources was calculated which is the sum of supply used domestically and export. The same input data and prices were used as previously used in calculating consumption of renewable electricity.

The supply of renewable energy consumed in domestic market was calculated as renewable electricity sold to the grid and own consumption minus export. Then the shares of use by sectors and renewable electricity unit prices for enterprises and households were applied. The total value of domestic supply of renewable electricity in producer price was found to be 117.6 mln € (168.3 mln € in consumer prices, from which network service fee, electricity excise and renewable energy charge comprise 35.4 mln and VAT is 15.3 mln €). No taxes and fees are charged from exported electricity and therefore producer's price of renewable energy (45.18 €/MWh) was applied to export. Export was 76.5 mln €. The value of imported renewable electricity was 56 mln € (125 mln € in consumer prices, from which network service fee, electricity excise and renewable energy charge comprise 48.1 mln and VAT is 20.9 mln €).

The sum of supply used domestically and export was divided between sectors using the shares found in EGSS calculation of the production of renewable energy, where the main suppliers are enterprises 99% and households contribute 1% percent as they sell electricity from solar energy that exceeds their own consumption to the grid. The results are given in Table 28.

Table 28. Supply of electricity from renewable sources by institutional sectors in 2020, million euros

Institutional sector	Supply of renewable electricity in producer prices	Import	Network service fee, electricity excise and renewable energy charge	Value added tax
Enterprises S.11	116.06			
General government S.13				
Households S.14	1.55			
NPISH S.15				
Total	117.61	56.02	83.49	36.22

3.9 Methodology for calculating consumption of heat from biogas

For calculating consumption of heat produced from biogas, data from Energy Statistics were used. The data included information about the producers and the amount (in MWh) of heat produced. In 2020 50 GWh of heat was produced from biogas by 12 enterprises.

In order to calculate the value of heat in monetary units, average price of heat was used. Average price of heat for enterprises in 2020 was 57.72 EUR/MWh. When multiplying the amount with the average price the consumption of sold heat from biogas in 2020 was 3.5 million euros. This can also be considered as supply as the data on production was used. Also, an attempt to calculate the extra cost was made. Available sale revenue for heat produced from biogas and sold amounts were investigated but the average price for EUR/MWh was lower than the average price of heat, therefore no extra cost for the product was identified.

The consumption was divided between institutional sectors using shares from SUT for product D.353 - steam and air conditioning. SUT for 2020 was not available, therefore the average shares from the last 5 years were used– intermediate consumption of corporations was ca 28%, final consumption of households was ca 53%, final consumption of general government was ca 17% and NPISH 2%.

In 2016 colleagues from Statistics Netherlands suggested distributing consumption of heat from biogas between institutional sectors using real data that was available for some of the producers from their business reports. Another distribution between sectors was made based on the data from energy statistics and business reports. During the years the profile of companies that produce heat from biogas seem to have changed and majority of the companies produce for their own use, only one company was confirmed to produce for the consumption of households. After using the information from the reports and energy statistics it was seen that 10 GWh was sold to households, 29 GWh was used for own production and 11 GWh was sold to other corporations. Consumption of heat from biogas by sectors is seen in Table 29.

Table 29. Consumption of heat from biogas by institutional sectors in 2020 according to SUT and business reports, million Euros

Institutional sector	Consumption of heat from biogas (business reports)	Consumption of heat from biogas (SUT)
Enterprises S.11	2.8	1.0
General government S.13		0.6
Households S.14	0.7	1.9
NPISH S.15		0.1
Total	3.5	3.5

The methodology is applicable also in the future but as it is not compulsory for producers to add sold amounts and consumers in business reports it could be necessary to contact producers for the detailed information.

3.10 Methodology for calculating consumption of solar panels

In the previous grant project consumption of solar panels was not assessed due to the adequacy of the data. In this grant project, we investigated how many solar panels were installed in Estonia in 2020 and their monetary value (Table 30).

Solar energy is an important source of renewable energy and increasingly available to a larger population. In today's energy crisis and increasing consumption of renewable energy sources, the installation of solar panels is a good investment. The installation of solar panels by households and the establishment of solar parks by companies has intensified in recent years in Estonia. There are several reasons for this: firstly, the price of solar panels has fallen, and increased availability of subsidies also have a major impact.

It was decided to use data from Elering, a national electricity grid operator. Elering has data on the capacity of solar panels installed in 2020 that are on-grid and plus the estimated capacity of solar panels installed off-grid in 2020. The total installed photovoltaic power for the year 2020 is 87070 kW.

To find the prices, we used sample projects of the companies, the calculations of which were visible. In addition, we used web-based price calculators to find the price of 1 kW of installed solar panels. In this chapter, the value of solar panels installed in 2020 was 72.78 million euros in producer price.

Table 30. Consumption of solar panels in Estonia in producer price, 2020, million euros, producers price

	Installed capacity 2020, kW	Price per kW, euros	TOTAL, million euros
PV <20 kW	15600	1000	15.60
PV 20-1000 kW	71470	800	57.18
TOTAL	87070		72.78

We received a positive assessment of the proposed methodology from Dutch consultants, the Netherlands use a similar methodology.

3.11 Methodology for calculating consumption of boilers for burning wood

An attempt was made to calculate the consumption of boilers for burning wood. In this chapter we include appliances that use wood or wood pellets as fuel. For this, Environmental Investment Centre (EIC) and the European Structural and Investment Fund database was used. Both databases contain information about boilers for burning wood installed in Estonia in 2020. The results are shown in Table 31. There was no need to add VAT or margins, since they are included in the investments. Unfortunately, this covers only the subsidized installments of boilers for burning wood. As such, there is a great under coverage of boilers installed, since there is also no information available to estimate the consumption of boilers installed without subsidies or by households. Furthermore, data on boilers for burning wood includes installation costs as it was not possible to separate the device cost from installation cost. Finally, foreign trade statistics are not detailed enough to distinguish boilers for burning wood to determine exact import and export.

Table 31. Consumption of boilers for burning wood in Estonia, 2020, million euros, purchaser price

Institutional sector	Consumption, %	Consumption, million euros
Enterprises S.11	90	3.41
Government S.13	3	0.10
NPISH S.15	7	0.25
Total	100	3.77

Methodology for boilers for burning wood needs to be improved, as it does not include boilers bought by households and without subsidies. This possibly creates a large underestimation in terms of boilers installed. To fix this, foreign trade statistics need to more detailed, and retailers/government need to collect and share data on wood fired boilers sold. This would also mean that it is possible to calculate the consumption of boilers for burning wood, without the installation costs.

3.12 Methodology for calculating consumption of compact fluorescent lamps (CFL) and most efficient domestic appliances

An attempt was made to calculate the consumption of LED- and compact fluorescent lamps (CFL) as well as most efficient domestic appliances.

For the lamps an assumption was made that LED lamps are better product because of their energy consumption and lifespan. CFL was therefore considered to be cheaper, inferior alternative to LEDs.

For most efficient domestic appliances, it was decided to evaluate the consumption of refrigerators, washing machines, dryers and dishwashers. Said products are large by size and energy consumption and are commonly found in households. This selection was made in discussion with representatives from the Ministry of Environment.

For both the lamps and domestic appliances data was gathered from Register of Products of Concern (abbreviation: PROTO) that is governed by the Ministry of Environment. As such, it was possible to determine the quantities of lamps and domestic appliances placed on market in 2020. For lamps it is also possible to use foreign trade statistics to evaluate the consumption of different types of lamps.

It was not possible to determine the consumption of lamps and domestic appliances is monetary value for several reasons:

- both LED and CFL lamps come in many different specifications (power consumption, output, size, shape etc.), therefor making it difficult to find comparable products that also represent the actual consumption.
- for domestic appliances there was no uniform European Union energy label in 2020 nor is there any data gathered about energy ratings in PROTO.

In the future it would be difficult to calculate the consumption lamps as it would require very detailed registry of lamps placed on the market. This, combined with pricing data, would make this very time consuming and not a viable option.

For domestic appliances, it could be possible to evaluate the consumption in the future. Uniform energy label makes it possible to directly compare the energy consumption of similar appliances in the same category. If energy label data is collected and made available in PROTO, it could be used as a source of data. Finding out the monetary value of products in different energy class would still be a problem, but a methodology similar to this used in electric vehicles chapter could be applied – scanning the market for selected list of products and calculating the full cost and extra cost based on sample products.

3.13 Methodology for calculating consumption of heat pumps

Consumption of heat pumps was one of the products that was analysed also in previous grant project. The main data source is Estonian Heat Pumps Association (EHPA) that has the information about yearly installed heat pumps on a heat pump type level inside the association, estimations about the number of installed heat pumps on a heat pump type level outside the association and estimations about the average price of heat pumps on a heat pump type level available. The estimations of the number outside the association were given as interval and the highest value was used in calculations.

Compared to the methodology developed in the previous grant project prices used in the calculations are more precise – in the previous grant project one price for all types of heat pumps was used. In the current project price data were available on a heat pump type level.

The consumption of heat pumps was calculated using simple formula – number of installed heat pumps was multiplied with average price. Consumption was divided equally between households and enterprises as we do not have good basis for the distribution. In order to calculate the consumption of households also VAT was added. Results of calculations on a heat pump level can be seen in Table 32. Total consumption of heat pumps was calculated to be 41 million euro in 2020.

As it was not possible to separate the users of heat pumps it was assumed that all heat pumps were used by households and enterprises equally.

Table 32. Consumption of heat pumps by heat pump type, 2020

Type	Number of installed heat pumps inside the association	Number of installed heat pumps outside the association	Total number of installed heat pumps	Average price, euro	Consumption of households, million euro	Consumption of enterprises, million euro	Total consumption, million euro
Ground source	1 855	50	1 905	7 200	8.23	6.86	15.09
Air-air	4 551	5 449	10 000	900	5.40	4.50	9.90
Air-water	2 092	500	2 592	5 700	8.86	7.39	16.25
Total	**8 498**	**5 941**	**14 497**		**22.49**	**18.75**	**41.24**

This methodology could be used also in the future only if EHPA provides necessary information for the calculations.

3.14 Methodology for calculating the consumption of low energy and passive buildings

Use of low energy consumption and passive buildings was not considered in previous grant project and the first attempt to estimate the consumption was made. Main data source is Environmental Goods and Services Sector (EGSS) where the production of low energy consumption and passive buildings is available. Only the construction of new buildings was considered under this product and not the renovation of existing buildings for energy saving purposes.

It was assumed that produced resource efficient new buildings has been used in Estonia and these were not exported or imported. The production of resource efficient new buildings in EGSS was elaborated in close cooperation with competent experts active in the field of construction and energy saving in Estonia. The opinion of experts was that EGSS output of new construction makes up approximately 20% of the total cost of new construction. The expert was also contacted during the grant project to discuss if the share has been changed by now as the 20% was the opinion in 2015. And the share was updated using the information from the expert.

Description of the methodology for new shares follows:

From the beginning of 2020 all new buildings must have A class energy class that means that new buildings must be nearly zero-energy buildings. This regulation does not apply to buildings that have less than 220 m^2 heated area and to other buildings for which solar panels are not economically reasonable or technically possible to install. These exceptions fall under B energy class, and these cannot be considered as energy efficient buildings. The expert also said that probably some of the new buildings built in 2020 are still not A class buildings as these were constructed with an old building permit given before the regulation. In order to update the share of energy efficient buildings the share of A class buildings from all new completed buildings was calculated and it was 31,9% for dwellings and 41,7% for non-residential buildings in 2020.

The value of total new construction was calculated using capital formation of dwellings and non-residential buildings from national accounts. First the capital formation was divided between renovation and new buildings using shares from construction statistics from Statistics Estonia. Then the values were multiplied with the share of A class buildings in 2020. The production of new energy efficient buildings in 2020 was calculated to be 627 million euro. The results of calculations can be seen in Table 33.

Table 33. Consumption of new energy efficient buildings, 2020

	New buildings in NA, million euro	Share of energy efficient buildings, %	Consumption, million euro
Dwellings	1 109	31,9	353
Non-residential buildings	656	41,7	273
Total	1 765		627

Using data from national accounts the users of new energy efficient buildings were allocated. National accounts investment data are available on an institutional sector and investment type level. It was seen that households were the main users of dwellings, and the use of non-residential buildings was divided between various sectors, corporations (56%) and general government (42%) were the biggest users. Results of users can be seen in Table 34.

Table 34. Consumption of new energy efficient buildings by user, 2020, million euro

Institutional sector	Dwellings	Non-residential buildings
Households S.14	353	1
Enterprises S.11		154
Government S.13		115
NPISH S.15		2
Financial institutions		1
Total	353	273

This methodology is also applicable in the future as data sources are probably available regularly. Another question arises – how to calculate extra cost for these buildings? It is very difficult to estimate average construction costs and therefore also extra cost of resource efficient buildings. As there were no good methodology to use in order to calculate the extra cost then Eurostat suggestion of using 20% as extra cost for energy efficient buildings was used. Results are seen in Table 35.

Table 35. Extra cost of new energy efficient buildings by user, 2020, million euro

Institutional sector	Dwellings	Non-residential buildings
Households S.14	70.7	0.2
Enterprises S.11		30.8
Government S.13		23.0
NPISH S.15		0.4
Financial institutions		0.3
Total	70.7	54.7

3.15 Supply and use tables for the environment and resource management goods assessed

In general, the production + import – export calculation was used with margins and VAT applied where necessary. Depending on the product, the methodology to calculate the total use and supply could vary. Table 36 below will show the basic approach to a specific product. Data from annual business reports, foreign trade and supply and use table was mainly used. In some case, experts and shareholders were contacted to obtain more detailed data. Empty cells could mean both that phenomena do not exist, or it was not measured.

Table 36. Methodology for calculating use and supply in purchaser price

Product	Methodology for calculating use	Methodology for calculating supply
Electric and more resource efficient transport equipment	Amount of sold vehicles * purchaser price = full cost full cost / EIC data = use by sector	Supply = import
Septic tanks	Production + import + margins + VAT	Supply = use
Waste containers	Import + margins + VAT	Supply = use
Organic food	Use data from EIER / SUT data = use by sector	Production + import + margins + VAT
Organic agricultural goods	Production / SUT data = use by sector	Production + margins + VAT
Electricity from renewable sources	((Sold electricity and own use – export + import)*average prices + VAT)/ PEFA data = use by sector	Production*average price + export – import +VAT and additional fees
Heat from biogas	Production* average price of heat + VAT, use by sectors based on statistics microdata and business reports	Production + VAT
Solar panels	Installed capacity of solar panels * average product price + margins + VAT	Production + import + margins + VAT
Boilers for burning wood	Investments made in boilers for burning wood by EIC and SF data	Supply = use
Fluorescent lamps (CFL) and most efficient domestic appliances	No methodology available	No methodology available
Heat pumps	Imported heat pumps from EHPA + VAT, use by sectors based on assumption	Imported heat pumps from EHPA + VAT
Low energy and passive buildings	Value of constructed new buildings * share of energy efficient buildings, use by sectors based on NA data	Value of constructed new buildings * share of energy efficient buildings

3.16 Use table for the environment and resource management goods assessed

Use table (Table 37) was created first, after studying each product individually. The table represents intermediate consumption, final consumption, gross fixed capital formation by institutional sector, exports and total use on product level. All prices represented in the use table are in purchaser price.

Table 37. Use table in purchaser price, 2020, million euros. IC- intermediate consumption, FC- final consumption, GFCF – Gross fixed capital formation

Products	IC S.11	IC S.13	IC S.15	FC S.14	GFCF S.11	GFCF S.13	GFCF S.15	GFCF S.12	Total GFCF	Export	Total use
Septic tanks				15.23						2.34	17.57
Waste containers				0.32	0.21		0.17		0.38		0.70
Boilers for burning wood					3.41	0.10	0.25		3.77		3.77
Solar panels				18.31	77.23	1.14	2.29		80.66	0.52	99.48
Heat pumps				22.49	18.75				18.75		41.24
Electric cars				12.65	4.88	0.36	0.18		5.42		18.07
Hybrid cars				2.01	5.22	0.15	0.07		5.45		7.46
Organic food	17.60	0.77	0.00	58.14						15.57	92.07
Organic agricultural goods	68.27			0.00						20.63	88.90
Renewable electricity	152.49	10.28	0.05	54.05						76.47	293.33
Heat from biogas	2.79			0.72							3.50
Low energy and passive buildings - dwellings				353.30							353.30
Low energy and passive buildings - Non-residential buildings				1.09	154.07	115.05	1.84	1.42	272.38		273.47
Total use of selected products	241.14	11.04	0.05	538.31	263.76	116.81	4.81	1.42	386.79	115.54	1292.86

3.17 Supply table for the environment and resource management goods assessed

After compiling use table for products under review. a supply table (Table 38) was created. This is to show the supply by institutional sector and import. The table also allows us to separate supply in producers price and purchasers price with margins and VAT calculated for each product.

To compile supply table. two different approaches were used:

For some products (e.g., septic tanks, wood fired boilers) bottom-up approach was used: production + import – export with margins and VAT added where necessary.

In other cases (e.g., organic food, organic agricultural goods), top-down approach was applied, and the starting point was total supply in producer or purchaser price. In such cases production, import, export shares were identified, margins and VAT were applied where necessary.

Table 38. Supply table, 2020, million euros

Products	S.11	S.13	S.15	S.14	Import	Total supply in producer price	Margins	Excise and additional fees	VAT and other additional taxes	Total supply in purchaser price
Septic tanks	4.69				7.12	11.81	3.22		2.54	17.57
Waste containers					0.47	0.47	0.15		0.08	0.70
Boilers for burning wood	0.30				2.22	2.53	1.14		0.09	3.77
Solar panels	4.75				68.55	73.30	22.56		3.62	99.48
Heat pumps					37.49	37.49			3.75	41.24
Electric cars					14.06	14.06	2.35		1.66	18.07
Hybrid cars					5.81	5.81	0.97		0.69	7.46
Organic food	16.76			6.07	31.67	54.51	23.94		13.63	92.07
Organic agricultural goods	47.58			17.24	1.32	66.14	6.22		16.54	88.90
Renewable electricity	116.06			1.55	56.02	173.63		83.49	36.22	293.33
Heat from biogas	2.92					2.92			0.58	3.50
Low energy and passive buildings - dwellings	353.30					353.30				353.30
Low energy and passive buildings - Non-residential buildings	273.47					273.47				273.47
Total supply of selected products	819.82	0.00	0.00	24.86	224.73	1069.41	60.56		79.40	1292.86

3.18 Extra cost table

It was also important to consider that in order to add the use of products to EPEA, it was necessary to calculate the extra cost of cleaner and resource efficient products (Table 39). Therefore, the possibility to calculate extra cost of these products was also investigated. For this, standard product price and cleaner goods price was compared. More detailed description of the methodology used for certain product can be found in the chapter about the product. Environmental specific products are included here using their full cost, since they lack extra cost. All prices represented in the extra cost table are in purchaser price.

Table 39. Extra cost table, 2020, million euros

Products	IC S.11	IC S.13	IC S.15	FC S.14	GFCF S.11	GFCF S.13	GFCF S.15	GFCF S.12	Total GFCF	Export	Total use
Septic tanks				15.23						2.34	17.57
Waste containers				0.32	0.21		0.17		0.38		0.70
Boilers for burning wood					3.41	0.10	0.25		3.77		3.77
Solar panels				18.31	77.23	1.14	2.29		80.66	0.52	99.48
Heat pumps				22.49	18.75				18.75		41.24
Electric cars				3.55	1.37	0.10	0.05		1.52		5.08
Hybrid cars				0.22	0.57	0.02	0.01		0.59		0.81
Organic food	7.87	0.34	0.00	26.00						6.96	41.18
Organic agricultural goods	14.64			5.31						4.63	24.58
Renewable electricity	2.51	0.17	0.00	0.89						1.26	4.83
Heat from biogas	2.79			0.72							3.50
Low energy and passive buildings - dwellings				70.66							70.66
Low energy and passive buildings - Non-residential buildings				0.22	30.81	23.01	0.37	0.28	54.48		54.69
Total extra cost for selected products	27.81	0.51	0.00	163.92	132.35	24.38	3.14	0.28	160.14	15.71	368.09

3.19 Questions and remaining issues related to specific environment and resource management goods assessed

3.20 products

Questions:

- **Organic food**

Consumption, cost and extra cost calculation are available thanks to data from Estonian Institute of Economic Research (EIER). Without their data, it would not be possible to analyze this product. EIER collects annual data on price of organic food and together with specialists and stakeholders assess the share of organic products on market. If EIER discontinues their project, Statistics Estonia would have to collect data on prices, market share and identify producers and contact them individually.

There is a question how to classify horticultural products properly – they are both food (e.g., tomato sold in store, in a salat at a restaurant, consumed by someone as food) and a product (harvested from the greenhouse, by a farmer, and sold as a raw material to a store/restaurant/households). Is it double counting if a product moves from organic farming sector to organic food sector, but it is counted in both sectors?

- **Heat from biogas**

Should own consumption of corporations be excluded or included in the calculation of consumption of heat produced from biogas? Calculations were done including own consumption of heat.

- **Renewable electricity**

Should own consumption of corporations be excluded or included in the calculations? What about own consumption (solar energy) of households? Calculations were done using quantity of sold electricity to the grid so own consumption was excluded.

Remaining issues:

For several products, it is not possible to separate them in National Accounts SUT or foreign trade statistics, as the data is too aggregated. Therefore, it was not possible to calculate the supply, consumption or export/import based on NA SUT and foreign trade statistics for such products.

- **electric and more resource efficient transport equipment**

An attempt was made to assess the cost of charging ports for electric vehicles (EV). This failed, as there is no data available how many charging ports were/are added each year. If such data was available, question would remain how to identify how many public and private charging ports were added. Right now, the total number of ports is available on government sites, but no one tracks the number of ports added over time.

- **septic tanks**

Investments made in this product are a very rough estimate – septic tanks are not distinguishable product in NA SUT. Furthermore, each producer must be identified and contacted individually for accurate data on production and sales. It is not possible to allocate consumption by sector as there is no data available.

- **waste containers**

Difficult to determine the consumption of this product, as each producer and distributer must be contacted individually. Annual business reports and SUT do not provide detailed enough information on said product. As with production shares and values, it is not possible to allocate use by sector, as there is no data available and private companies are not eager to share such information.

- **organic products**

It is also not possible to separate organic grain and livestock from regular products in foreign trade statistics and NA SUT. As such, import and export values have to be guesstimated. Unlike organic food, there is not pricing data available for organic products to calculate extra cost. As such subsides allocated to organic farming were used to indicate extra cost (as subsidies in principle are meant to cover the extra cost of organic farming compared to traditional farming).

- **boilers for burning wood**

Data are available only from subsidies and does not include boilers bought without subsidies or by households. Product is not distinguishable in foreign trade or NA SUT. Cost includes installation cost and other activities as subsidies data is not detailed enough to determine product cost alone.

- **compact fluorescent lamps (CFL) and most efficient domestic appliances**

CFL technology is almost obsolete according to one major lamp distributer in Estonia – LED technology covers almost the whole market, at very least it is now dominant. As such, CFL should not be considered resource or energy efficient appliance and should be replaced with LED or some other new technology.

For other energy efficient domestic appliances read the description in the report for better and more detailed information. Uniform energy labeling could make it possible to estimate sales and extra cost of such products.

- **heat pumps**

Due to the lack of data sources it was not possible to separate the users of heat pumps by sectors therefore assumption that all heat pumps were used by households and enterprises equally was used.

3.21 Used materials

ReMEA: draft guidelines: https://ec.europa.eu/eurostat/documents/1798247/6191545/1-Resource-management-expenditure-accounts---draft-guidelines-2014.pdf/

Environmental protection expenditure accounts HANDBOOK 2017 edition: https://ec.europa.eu/eurostat/documents/3859598/7903714/KS-GQ-17-004-EN-N.pdf/7ea9c74b-eda4-4c23-b7bd-897358bfc990?t=1489135578000

Guidance note – Reporting of electric and more resource-efficient transport equipment in EPEA and EGSS accounts: https://ec.europa.eu/eurostat/documents/1798247/12177560/Guidance+note+on+electric+transport+equipment+-+technical+note.pdf/2ddec6dc-8ca9-1736-0f36-18ed2233af0b?t=1609859296315

ANNEX 1. Expanding EPEA with resource management products and environmental protection goods in Estonia

1.1. Overview of Association of Issuing Bodies (AIB)

Estonia is a net electricity exporting country. Intensive foreign trading of electricity takes place with Finland, Latvia and Lithuania. Therefore, the determining of origin of the electricity consumed in Estonia is quite a complicated task. An option to solve this problem is to use the statistics available from the Association of Issuing Bodies (AIB).

The purpose of the AIB is to govern the European Energy Certificate System (EECS). The members of AIB consist of competent transmission system operators, electricity regulators and energy market operators across Europe. EECS is a harmonized system for handling Guarantees of Origin and other energy certificates.

Under European Union directive for internal energy market. all electricity suppliers must inform their customers of the origin and environmental attributes of sold electricity. In order to avoid double counting of renewable electricity sold with guarantees of origin. a residual mix is calculated on international level. The basic idea for residual mix calculation is the following: it represents the production mix of a country corrected with generation attributes which are explicitly tracked. Residual mix is used to determine the energy origin of untracked consumption. Untracked consumption is consumption which has not been disclosed with explicit tracking instruments, for example guarantees of origin. If not all electricity of a country's production is tracked, a residual mix should be calculated.

The effect of international exchange of electricity and guarantees of origin is mostly seen in countries who have no domestic production. The origin of energy in these countries is a combination of energy imported and thus coordination is needed to know the origin of the imported electricity.

Because the calculation of residual mix needs to be Europe-wide, a simple bilateral balancing is not possible where one country who is the importer of energy simply fills energy origin from the country it is importing from. which would be the ideal case but not possible practically. In order to tackle this problem a fundamental feature called European Attribute Mix is used. This is a common attribute pool. which connects the domestic residual mixes together. And instead of interacting with each other. countries interact with this common pool of attributes. Countries can calculate their own domestic residual mix. but need to coordinate it with the centralized hub to form the European Attribute Mix.

The scheme works as follows:

Countries that have a surplus of generation attributes compared to their consumption (typically net importers of guarantee of origins and/or electricity net exporters) feed attributes to the European Attribute Mix according to the shares of different energy sources and intensity of CO2 and radioactive waste in their domestic residual mix.

European Attribute Mix is established as the total of all the surplus attributes.

Countries that have a deficit of generation attributes compared to their consumption (typically net exporters of guarantee of origins and/or electricity net importers), receive these attributes from the European Attribute Mix according to the shares of different energy sources and intensity of CO2 and radioactive waste in the EAM to fill in their domestic residual mix with the amount of the deficit.

This methodology ensures that total surplus equals total deficit in volume and there is a physical balance and no double counting.

The AIB applies the methodology developed in frames of two projects Reliable Disclosure

Information for European Electricity Consumers and performed by the Öko-Institut e.V . (available on http://www.reliable-disclosure.org/documents/).

The AIB annually calculates and publishes the common European Attribute Mix (EAM) and for electrical systems of every EU member state a production mix (PM). residual mix (RM) and the total supplier mix (TSM). The TSM data that are based on certified guarantees of origin (GO) taking into account in addition to production data the foreign trade of electricity.

The data for 2016 is available on https://www.aib-net.org/en/rm2016.

[1] Reliable Disclosure Information for European Electricity Consumers. Final Report from the project "Reliable Disclosure Systems for Europe (RE-DISS)". Öko-Institut e.V. December 2012.

[1] Reliable Disclosure in Europe: Status. Improvements and Perspectives. Final Report from the project "Reliable Disclosure Systems for Europe - Phase II" (RE-DISS II). Öko-Institut e.V. November 2015.

1.2. Seminar for the introducing of the results*, summary

*Improving the timeliness and granularity of EPEA and EGSS and expanding EPEA with resource management products and environmental protection goods in Estonia

Meeting 2022.12.06

Participants: Kaia Oras (Statistics Estonia) ; Grete Luukas (Statistics Estonia) ; Helen Saarmets (Statistics Estonia) ; Raigo Rückenberg (Statistics Estonia) ; Kerli Ojakivi (Ministry of the Environment) ; Laurina Šinkejeva (Ministry of the Environment); Marika Ruberg (Ministry of Rural Affairs) ; Külli Tammur (Ministry of the Environment) ; Hannela Artus (Ministry of the Environment) ; Helena Gailan (Ministry of the Environment) ; Katrin Koppel (Ministry of the Environment) ; Görel Grauding (Ministry of the Environment) ; Krista Kupits (Ministry of the Environment) ; Sigrid Soomlais (Ministry of the Environment) ; Marika Lillemets (Ministry of the Environment) ; Velda Buldas (Ministry of Finance) ; Alar Valdmann (Ministry of the Environment) ; Irje Möldre (Ministry of Economic Affairs and Communications)

Statistics Estonia goal: presenting the grant report „Improving the timeliness and granularity of EPEA/EGSS and expanding EPEA with resource management products and environmental protection goods in Estonia" and it's results

Introduction: Statistics Estonia has compiled a report „Improving the timeliness and granularity of EPEA/EGSS and expanding EPEA with resource management products and environmental protection goods in Estonia". Mr. Raigo Rückenberg, Ms. Grete Luukas and Ms. Kätlin Aun from Statistics Estonia presented the results of report and answered any questions by stakeholders. The discussed topics/products were:

- electric and more resource efficient transport equipment
- septic tanks
- waste containers
- organic food
- organic agricultural goods

- electricity from renewable sources
- heat from biogas
- solar panels
- boilers for burning wood
- fluorescent lamps (CFL) and most efficient domestic appliances
- heat pumps
- low energy and passive buildings

Presentation: Our project goals were introduced, and a short overview of CEPA/CrEMA classification were given to the stakeholders. Forementioned products/topics were introduced to the stakeholders, along with a list of general methodologies used and list of products considered, but not covered in our report. A short explanation was given to stakeholders as to why certain products were not covered in our report. As the last chapter, supply and use table and extra cost table for selected products was presented. The coverage of topics/products during the presentation consisted of brief overview of methodology and results presented in monetary value and usage by institutional sector.

Questions:

- Ministry of the Environment (MoE): What is the average price of hybrid and electric cars?

Statistics Estonia (SE): As the price difference between the lowed and highest paying hybrid and electrics is very high and depends heavily on the make and model, the average price was not calculated. Average price would not be proper indicator nor was this in our project scope.

- MoE: Is there a possibility that environmentally friendly product can be cheaper and also financially more viable product than the “normal” product it is compared to?

SE: Absolutely. This can already be observed with the electric cars and with some other products as well on certain occasions.

- MoE: Are the investments viewed in this project purchasers’ price or does it include life cycle assessment/cost?

SE: Purchaser’s price. No life cycle assessment or other costs, such as cost related to utilization, etc, were evaluated in this project.

- MoE: For certain products the life cycle cost/utilization cost is already included in the purchaser’s price.

SE: This is something we can think about and consider in the future. We are interested in hearing more of your comments and suggestion on that topic, please forward them to us via e-mail after this meeting.