Ref. Ares(2023)6337367 - 19/09/2023

AGRO FOSSIL FREE

Report on research project results on FEFTS – 2nd update

Del 2.7

Type: Report, Deliverable Title: Report on research project results on FEFTS (2nd update)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement ID 101000496

Document Summary

Deliverable Title**: Report on research project results on FEFTS – 2nd update**

Version: **1.0**

Deliverable Lead: **IUNG-PIB**

Related Work package: **WP2**

Author(s): **Małgorzata Wydra, Magdalena Borzęcka (IUNG)**

Contributor(s): **Foteini Vandorou (CERTH)**

Communication level: **PU Public**
Project Number: **101000496**

Grant Agreement Number: **101000496**

Programme: **AgroFossilFree**

Start date of Project: **October 1st, 2020**

Duration: **36 months**

Project coordinator: **Thanos Balafoutis - CERTH**

Abstract

AgroFossilFree project's objective is to create a framework under which critical stakeholders will cooperate to evaluate and promote currently available fossil-energy-free strategies and technologies (FEFTS) in EU agriculture to diminish in the short term and eliminate in the long run fossil fuels use in any farming process from cradle to farm gate, while maintaining yield and quality of the end-product.

The aim of the current document is to present the report on methodology and standards regarding the performance of systematic review of research results from projects on FEFTS application in agriculture or related domains. The report covers three periods of FEFTS collection conducted during the course of the project and presents the analysis of all the selected research project results both in total and in comparison, with the previously discussed partial results.

This report is organized and structured in five distinct chapters, each one addressing a specific aspect regarding FEFTS identification, screening and analysis that were performed in the first and second stage of research projects collection. In the first part, an initial assessment of the identified projects was carried out. The second part of the report describes the conduct of a survey in order to be able to perform analyses in the next one. A summary of the works and results is provided in the fourth part. The fifth part is the annex. This report is the updated version of D.2.5 and D2.6 as it contains all the Research Projects results on FEFTS gathered during the complete FEFTS collection process.

Contents

List of Figures

List of Tables

1. Introduction - Initial Identification

In the framework of Task 2.4 of WP2, and based on the instructions provided in Deliverable 2.1, the AgroFossilFree team identified over 100 research projects in the first, over 60 in the second, and over 20 in the third collection period, to be included in the AgEnergy Platform. The task was carried out in cooperation with all the project partners and was coordinated by IUNG-PIB. Realization of the task included preparation of a video tutorial, which helped the project partners in selection and submission of identified research projects on FEFTS using a dedicated questionnaire. Selection of research projects was conducted according to the Rogers's method for evaluation of innovations, in a five-step decision-making process. In the first stage, general information such as project title and abstract were checked. In the second stage, detailed information about the project was studied, including specific objectives and results achieved. In the third stage of the procedure, innovativeness of each project in regards to agricultural defossilisation was investigated together with advantages and disadvantages of the solutions offered. In the fourth stage, the decision about the relevance of a given project was made. Finally, the project validation and submission was executed.

1.1. Sources' Definition of Research Projects on FEFTS and Search Limits

In order to collect research projects on FEFTS, the following repositories were chosen: CORDIS, EIP-AGRI, Interreg and LIFE projects databases, identified as the biggest and covering the widest scope of topics, hence the most probable to provide relevant search results for FEFTS identification for the purpose of the AgEnergy Platform. However, eligible sources for research projects are also the ones that are available in each country of AgroFossilFree partners and contain national projects of that kind.

CORDIS stands for the Community Research and Development Information Service, which aims to foster accessibility of research results to researchers and other professionals and thus stimulate development of innovative products and solutions. CORDIS offers a repository[1] of project results provided by the European Commission, consisting of the projects funded by the EU framework programs for research and innovation. It was the primary source used in the first stage of building the AgEnergy Platform for the identification of research projects on FEFTS. CORDIS repository proved to offer a vast range of results that matched the anticipated outcome.

In the first stage of FEFTS collection, CORDIS repository offered 68 results matching the identification criteria that were submitted to the AgEnergy Platform. In the second stage, a complementary search was performed, based on a new, adjusted set of keywords that allowed for further identification of 29 more research projects relevant to the objectives of Work Package 2.

The LIFE program repository[2] was selected for its climate-oriented projects focusing on nature protection, clean energy transition, circular economy and climate change mitigation and adaptation – all of which are closely related to the aim of fossil energy free agriculture. LIFE program takes up numerous initiatives with the aim to foster development of clean technologies and protection of natural environment. The second stage of FEFTS collection

[1] https://cordis.europa.eu/projects
[2] https://webgate.ec.europa.eu/life/publicWebsite/search

regarding research project results was carried out based on the LIFE programme repository. It allowed for identification of 21 project results on FEFTS.

EIP-AGRI is the European Innovation Partnership for Agricultural productivity and Sustainability that aims to foster competitive, innovative and sustainable agricultural and forestry practices in accord with protection of environment and its natural resources. The EIP-AGRI project repository[3] was, therefore, chosen as a source of projects offering innovative solutions for European fossil free agriculture as it aims to "achieve more from less" when it comes to management of natural resources, and works to bring together research and practice in finding new innovative solutions for European agriculture.

Interreg is a European Union program encouraging cooperation between countries and regions jointly addressing common problems and finding solutions in many relevant areas. The Interreg project database[4] was chosen with the aim to find universal solutions for fossil free agriculture in Europe.

The EIP-AGRI & Interreg project databases were searched for relevant research projects results in the 3rd collection period. This search gave the result of 30 new research projects on FEFTS, out of which 23 were selected and published on the AgEnergy Platform.

1.2. Search Queries Methodology

In order to conduct a search in the CORDIS repository, a search engine provided by CORDIS was used: https://cordis.europa.eu/search. The search queries methodology applied to research projects was based on the description provided in Deliverable 2.1, and, more specifically, on the FEFTS categories presented in the Chapter 3.2 - Description of FEFTS. The Chapter presented FEFTS as divided into main categories, level 1 sub-categories and level 2 sub-categories. Based on that categorization, the queries for each clean energy supply, energy efficiency and soil carbon sequestration were produced. Indicatively, Table 1 shows the queries regarding Renewable Energy Sources. For the rest, please follow Annex 1.

Table 1. RES categories with assigned keywords used in CORDIS database search – 1st collection period

Level 1 RES category	Level 2 sub-categories	Keywords (to be included in the query)
Solar		agriculture/farming/farmer, energy, solar/photovoltaic
Wind		agriculture/farming/farmer, energy, wind
Hydro		agriculture/farming/farmer, energy, hydro
Biomass	Pellets	agriculture/farming/farmer, energy, biomass, pellets
	Woodchips/ wood logs	agriculture/farming/farmer, energy, biomass, woodchips/wood logs
	Energy crops	agriculture/farming/farmer, energy, biomass, energy crops
	Agricultural residues	agriculture/farming/farmer, energy, biomass, agricultural residues
Landfill gas		agriculture/ farming/farmer, energy, landfill gas
Biogas		agriculture/ farming/farmer, energy, biogas

[3] https://ec.europa.eu/eip/agriculture/en/find-connect/projects
[4] https://www.interregeurope.eu/projects/

In the second stage of FEFTS collection, the search in CORDIS repository was complemented by adding search queries including new keywords. The keywords were chosen based on the analysis of the first FEFTS collection results, with the aim to collect more project results in the less numerous categories of FEFTS. The new keywords included in the search are presented in Table 2.

Table 2. Further RES categories with assigned keywords used in CORDIS database search – 2nd collection period

Level 1 RES category	Level 2 sub-categories	Keywords (to be included in the query)
Energy type	Heating	agriculture/farming/farmer, energy, heating/cooling
	Cooling	
Energy storage		agriculture/farming/farmer, energy, storage
Energy saving/ energy efficiency		agriculture/farming/farmer, energy, saving/efficiency
Soil carbon sequestration		agriculture/farming/farmer, carbon sequestration

The search in LIFE program database, due to its different structure, was based on a different set of queries, modified to fit the filtering options offered by the Advanced Search on LIFE Projects: https://webgate.ec.europa.eu/life/publicWebsite/search/advanced. The filtering options allowed for choosing the thematic area of search (option "Select Themes") and keywords specific to that area (option "Select Keywords"). The list of themes and keywords used for search in the LIFE database is presented in Table 3.

Table 3. RES categories with assigned themes and keywords used in LIFE database search – 2nd collection period

Thematic area	Keywords
Agriculture - Forestry	Renewable energy
	Energy efficiency/energy saving
	Energy supply/ energy production
	Clean technology
	Soil carbon sequestration
Cleaner technologies	Agriculture
	Agricultural waste
Resource efficiency	Agriculture
Natural resources and ecosystems	Agriculture
Carbon sequestration	Agriculture
Energy efficiency	Agriculture
Renewable energies	Agriculture
Energy: efficiency, saving, supply	Agriculture

In the third stage of FEFTS collection, two other databases were searched: EIP-AGRI and Interreg. In case of the EIP-AGRI repository, the search was based on a list of keywords related

to the specific category of FEFTS and an additional keyword narrowing the search results to the area of interest e.g. the purpose of the result, its intended use or the resource which the solution was based on/required for exploitation. Table 4 presents the sets of keywords used for the search performed in the EIP-AGRI database. Each search based on a sequence of keywords provided a number of results, which altogether amounted to 87 research projects. First, all the duplicates existing among the search results were removed, then, the results were screened for relevance, and finally, the remaining results were screened for duplicates against the research projects already published on the Platform. The screening process allowed for identification of 15 new research projects relevant for the topic of fossil energy free agriculture and suitable to be incorporated in the website.

Table 4. Keywords used for the search in EIP-AGRI database, based on the RES categories – 3rd collection period

Level 1 keywords	Additional keyword
hydropower, passive solar building design, solar energy, wind energy, wind turbine	energy
biomass, biomass production, forest biomass, crop residue, manure	energy
biofuel, biogas, biodiesel	energy
energy efficiency, energy conservation/saving, renewable energy resource	heat, heating
	electricity
	cold, cooling
energy conservation, energy saving, energy efficiency	renewable energy
carbon footprint, carbon cycle, carbon retention, emission reduction, soil organic matter	carbon sequestration

Since the Interreg database comprises a high number of different Interreg programmes, for the purpose of our research, Interreg Europe[5] was chosen as the most suitable for the context of the AgroFossilFree project. In this programme, relevant projects were searched for according to their priority area: green, and a number of keywords, which differed depending on the area chosen. The list of keywords used for the search is presented in table 5.

Table 5. Keywords used for search in the Interreg Europe database – 3rd collection period

Funding Programme	Priority area	Keywords
Interreg Europe	green	Energy efficiency
		Renewable energy
		Smart energy systems
		Climate change
		Circular economy

The performed search resulted in a list of 59 projects, which were screened for duplicates and for relevance, following the procedure used in the case of EIP-AGRI search results. The

[5] https://www.interregeurope.eu/

screening process reduced the number of Interreg Program research projects suitable for publishing on the Platform to 10 FEFTS.

1.2.1. Queries creation (CORDIS Methodology)

For each of the Level 1 categories, a query was created containing the keywords (e.g. Table 1a). For each specific query, the following filters provided by the CORDIS search engine were also chosen:

Collection: Projects

Program: H2020 OR FP7

Start date: after 01/01/2011

For most of the Level 1 categories, only one query was prepared, which provided a reasonable number of results for screening. In case of the "biomass" category, a further detailed sub-categorization was necessary, since the high number of results obtained and the initial screening suggested a large portion of research projects that may not address agricultural biomass. Therefore, a sub-categorization was introduced, specifying the biomass categories relevant for agriculture and forestry. Specific queries used for project search in each category are presented in Annex 1.

In the second and third collection period, queries were prepared based on the same methodology, modified to fit the filtering options provided by each of the repositories. In the case of all three databases, namely LIFE, EIP-AGRI, and Interreg, the queries used keywords from the list of prompts.

In the case of the LIFE database, keywords were chosen based on each level 1 category from the list provided by the filtering options.

Since the EIP-AGRI database is devoted to research projects focusing on agriculture and forestry practices, those areas were not specified in the search queries. The filtering included keywords based on the RES categories, renewable energy sources and intended types of solutions.

In the case of the Interreg database, queries were much more simplified, as the filtering engine allowed for selecting the priority area and a category of focus – no additional keywords were allowed to be introduced by the user.

1.2.2. Queries creation (LIFE Methodology)

The search of LIFE Programme database followed the same methodology as described above. Apart from the filtering options included in Table 3, the search engine allowed also for specifying the time scope of research projects. The chosen time scope set projects starting date at no earlier than 01/01/2011. Other filtering options provided by the search engine were not used.

The search provided over 100 results, which were carefully analyzed and 21 of them were then selected to be submitted to the AgEnergy Platform.

Apart from the 118 results collected from CORDIS and LIFE databases, a considerable number of research projects was collected by project partners, namely 39 in the first and 12 in the second collection period. Those projects were directly identified from various available sources and platforms of national scope. In the third collection period, no national projects from any other sources apart from EIP-AGRI and Interreg database were submitted. The third and last collection period resulted in 30 submitted research projects, which, after the further screening by the quality committee, gave the final result of 23 new research project results on FEFTS.

2. Survey

The conducted survey consisted of four sets of questions described initially in Chapter 4 of Deliverable 2.1. Questions from **Section 1** referred to general information about the identified FEFTS and the person submitting the survey: organization, contact email, FEFTS category. **Section 2** questions were project specific such as project abstract, language, coordinator and their contact information, project status and funding. **Section 3** regarded FEFTS specifications such as its purpose and application field. **Section 4** consisted of specific information depending on the type of FEFTS: Clean energy production, Energy efficiency improvement or Soil carbon sequestration, followed by specific sub-categories regarding energy type, technology used etc. The last one, **section 5**, grouped questions referring to FEFTS assessment – environmental and socioeconomic - provided by the person submitting the survey and performed to the best of their knowledge, based on the available information.

The aforementioned structure of the survey as well as the analysis of the results on research projects on FEFTS, presented in Chapter 3, are based on the structure established on D2.1. A basic schematic of this structure is presented in Table 4.

Table 6. FEFTS categories and level 1 and level 2 subcategories

FEFTS category	Level 1 sub-category	Level 2 sub-category
Energy User/Consumer	Agricultural technology applications	heating and cooling of buildings
		process heat/cold
		lighting
		agricultural field practices
		vehicles
		tools
		energy sales to external consumers
Clean Energy Supply	Renewable Energy Sources	solar
		wind
		hydro
		geothermal
		bioenergy
		free energy
	Energy types	heating
		cooling
		electricity
		mechanical energy
		chemical energy
	Energy Technologies	photovoltaics

		solar thermal
		wind mills
		hydropower
		heat pumps
		geothermal
		solid biomass conversion
		biogas / biomethane production
		liquid biofuels production
	Energy Storages	heat storage
		electricity storage
		cold storage
		intermediate bioenergy carriers
Energy Efficiency Improvement	Energy savings	efficient buildings
		efficient vehicles
		efficient tools
		precision agriculture
		precision livestock farming
		conservation agriculture
Carbon sequestration	Carbon sequestration	soil organic cover
		tillage (Conservation Agriculture + CTF)
		nutrient management
		crop diversification
		soil and water conservation techniques
		fire management
		grassland management

In the second and third collection period, new FEFTS were submitted directly on the AgEnergy Platform, using the survey as a form incorporated in the website. The use of the Google Forms survey was discontinued. Annex 4 contains the link of the AgEnergy Platform submission form for research projects.

2.1. Data Collection

Identification of research projects on FEFTS was a joint task of all project partners conducted under the coordination of IUNG-PIB. This condition was formulated in order to make sure all countries involved in the project are well represented in terms of collected FEFTS.

All project participants have been responsible for the collection and reporting of research projects about FEFTS. As the Task Leader, IUNG-PIB was responsible for registering European research projects. The rest of the partners were assigned the task to identify and register research projects of their countries (national scope). The target (100 research projects until September 2021 and additional 50 until September 2022) that had been set in the project's 2nd plenary meeting (25/5/2021) and the collected research projects are shown in Table 7. In total, 161 Research Projects have been gathered during both collection processes (102 during the 1st collection process and 59 during the 2nd). In the third collection process, the target number of research project was not high, as the already published FEFTS in this category constituted a large collection. Nevertheless, for the sake of a better representation of the EIP-AGRI and Interreg projects, the target number was set at a minimum of 10 new FEFTS, which

was finally exceeded by 30. The search conducted in all three collection periods delivered jointly 180 project results on FEFTS.

Table 7. Specific targets of FEFTS for the 1st, 2nd and 3rd collection periods

FEFTS TYPE	Partner	1st collection period targets (approx.)	2nd collection period targets (approx.)	3rd collection period targets (approx.)
Scientific Papers	CERTH	500	250	250
	All other partners			
Research Projects	**IUNG-PIB**	**100**	**50**	**10**
	All other partners			
Commercial Technologies	WIP	200	230	130
	All other partners			
Training Material	WIP	40	65	30
	All other partners			
Financing Mechanisms	AU	50	80	30
	CERTH			
	All other partners			
	Total	**~900**	**~700**	**~450**

Table 8 shows the individual goals set for the 3rd FEFTS collection process for each category of FEFTS and the actual results achieved. The planned numbers take into account the previous periods' results. The final targets of the 3rd collection period have therefore been increased to make up for the previously lacking categories or decreased in case of exceedingly good results from the previous collection periods.

Table 8. Overview of collection status (the 3rd batch)

	Scientific Papers	Commercial Technologies	Training Material	Financing Mechanisms	Research projects	Total
Planned	253	131	27	31	10	452
Collected	257	163	44	39	30	533
Published	247	152	40	35	23	497

The whole identification and registration process was supported by an online thread for Task 2.3, which was created on the Microsoft Teams platform to host Q&As about research projects, between the Task Leader and partners. All partners supported each other in the collection process throughout the project period, making sure the target numbers are reached.

2.2. Screening of Research Projects on FEFTS

The selected results (from the 1st batch) were submitted by filling a questionnaire in Google Forms, and then downloaded in excel file. All the records were subjected to initial screening in order to remove duplicates or incomplete FEFTS. The first step of initial screening had already been done before the submission of Deliverable 2.5, as all records were screened in order to delete duplicate, malicious and incomplete entries. "Incomplete entries" were

considered those lacking an exhaustive description and information, thus making their evaluation impossible. For these records, partners were asked to insert additional information. If not available, those entries were completely deleted from the inventory. After the initial screening the number of FEFTS in the category of research projects changed from 107 to 102.

The main screening process took place before the launch of the platform, which ensured that all the collected FEFTS fulfil the acceptance criteria discussed below, and presented information on each FEFTS are well categorized (detailed analysis of FEFTS categorization will be discussed further in this document). The final screening procedure eliminated another 3 records, giving the final result of 99 research project results on FEFTS submitted and published at the AgEnergy Platform. A similar procedure took place for the second period of FEFTS collection. After the collection of 64 new project results on FEFTS, removal of incomplete entries gave the result of 60 new FEFTS submitted to the Platform. Before publishing them, a final screening process was carried out by the quality committee, which resulted in 59 research projects on FEFTS published on the AgEnergy Platform. In the third screening process, the 3rd batch of the collected research project results was screened immediately after their submission and reduced the final number of new FEFTS published on the Platform from 30 to 23. Moreover, the platform is continuously being checked for outdated information or broken links to FEFTS, thus we make sure that the materials published for end-users are of high quality and relevance, and do not include malicious or faulty links to external sources. As a result of that additional screening, one of the previously published FEFTS has been removed from the final repository. Altogether, the three stages of FEFTS collection gave the result of 180 research results on FEFTS, published and ready to provide information to end-users browsing the Platform.

It should be mentioned, though, that our database is open for public entry so that interested stakeholders are also able to input additional data. Their entries will be unpublished until they are validated by the FEFTS Quality Committee. By doing so, the accuracy and reliability of the platform's information regarding its relevance with the objectives of the AgroFossilFree project is guaranteed.

2.2.1. Acceptance Criteria

The applied queries gave us so far a result of over 500 international projects related to the topics determined by the keywords and realized in the period of 01/01/2011–01/01/2022 (recent projects). The screening process was conducted based on particular acceptance criteria. More specifically as appropriate entries were thought of projects which:

- Describe innovative energy saving or RES-based solutions and limiting the carbon dioxide emissions from agriculture;
- Offer practical solutions rather than theoretical knowledge;
- Are of high applicability & availability of FEFTS to farmers;
- Have TRL (technology readiness level) of at least 7 and above, offering a solution ready for implementation;
- Are of high relevance for the context of European agriculture;
- Offer clear benefits for farmers.

Any research project that does not follow the aforementioned criteria and does not clearly provide an alternative solution on the fossil fuel use in agriculture is excluded from the AgEnergy Platform inventory.

2.3. General characteristics on research projects on FEFTS

In the first period of FEFTS collection, after the completion of the screening process, a number of 99 FEFTS were submitted to the AgEnergy Platform. After the second collection period, the number of FEFTS published on the Platform increased to 158. After the third and last collection period, the final number of FEFTS presented on the AgEnergy Platform amounted to 180.

The diagram below shows the share of projects selected in the all three collection periods, according to project languages.

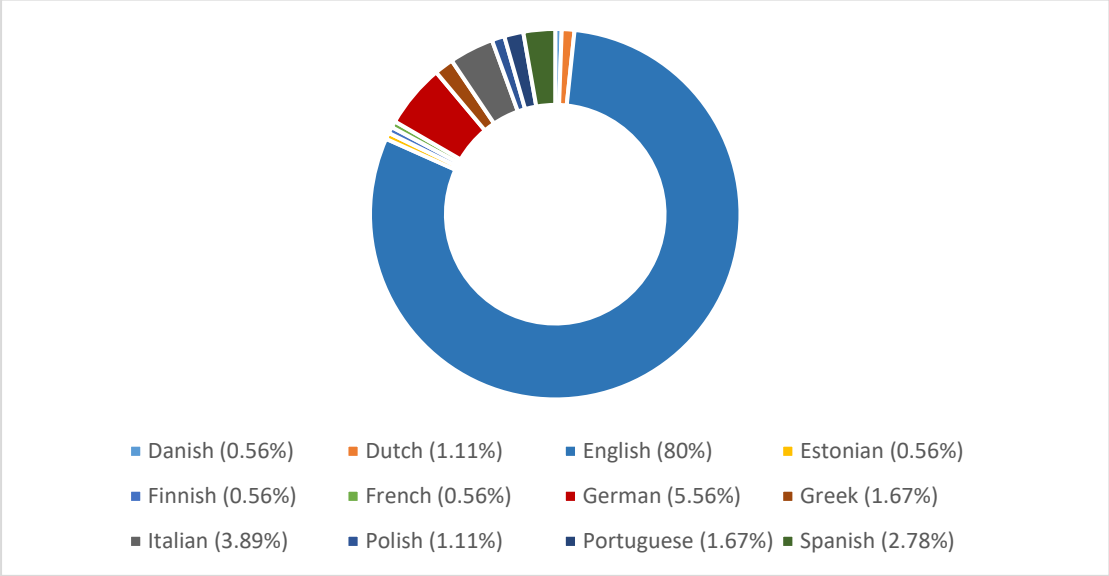

Figure 1. Classification of the research projects selected in all three collection periods, based on the project language

English language projects clearly constitute the largest group – 80% of all published projects (Figure 1), which is made up not only by the international projects selected from the CORDIS, LIFE, EIP-AGRI and Interreg repositories, but also projects identified in the national repositories that chose English as the language of their work environment. This may be an asset in making the selected FEFTS available to a larger audience. However, most of the international projects offer descriptions of FEFTS in several languages, depending on the project partners/coordinators. Nevertheless, to make the collected FEFTS available to all the potential users, the main information presented on the AgEnergy Platform has been translated into the languages of all the project partners.

Regarding the classification of the research projects based on the country of the coordinator, it is evident from Figure 2 that in the first collection period there is a wide range of European countries with Spain having the most entries, followed by Germany, France, Greece and the Netherlands. After the second collection period, the trend changed slightly: with Spain still best represented in terms of selected FEFTS, the second and third place belong to Germany and Italy, respectively. After the third collection period, Spain still has the most entries (46), followed by Germany (21), Italy (20), and equally well represented Greece, France and the Netherlands, each with 11 research projects. Still, 5 projects out of all the collected are

grouped in the “Europe” category, since neither their scope nor the coordinator allowed for identifying a specific country responsible for the project realization. The final distribution of research projects on FEFTS based on the coordinating country is shown in Figure 2.

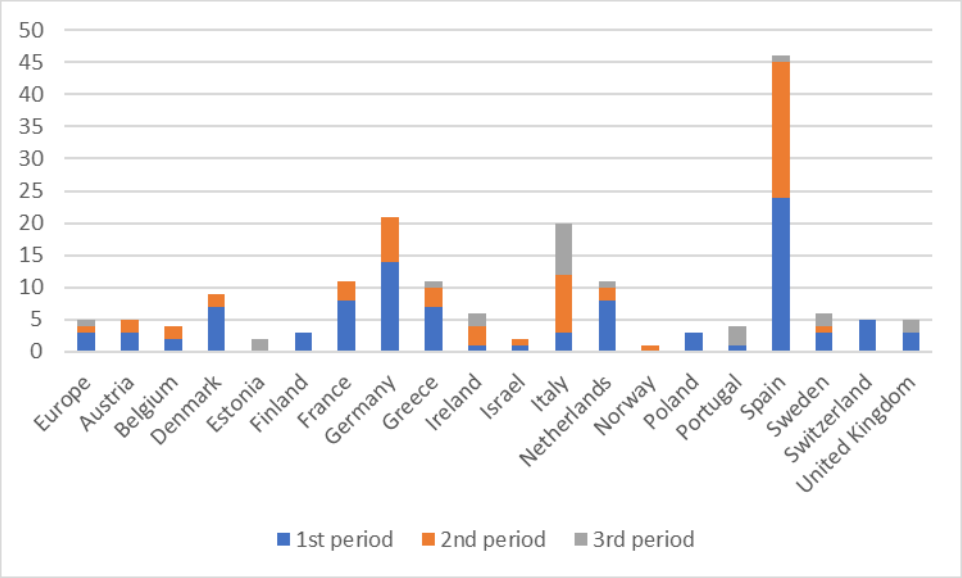

Figure 2. Classification of the research projects selected in all three collection periods, based on the country of the coordinator

All the selected projects are recent projects, and currently, 16% of them have the ongoing status compared to 29% after the 2nd period, and 31% after the 1st one. It means that a large portion of the research projects present recently developed FEFTS. This ensures high relevance of FEFTS in terms of finding state-of-the-art answers to the current problems and avoiding outdated solutions. The share of ongoing and completed projects in each FEFTS collection period is presented in Figure 3.

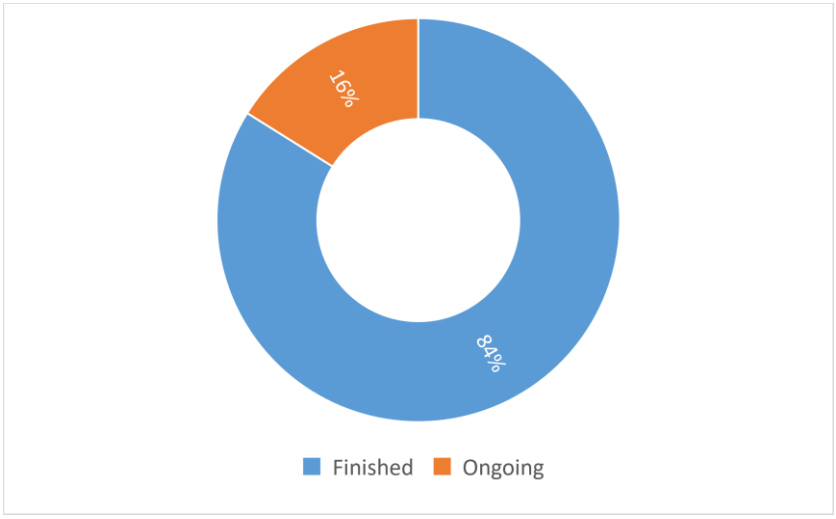

Figure 3. Classification of the research projects selected in all three collection periods, according to the status of their completion

The grand majority of research projects received funding from the Horizon 2020 research and innovation program, namely 60% of all collected research projects, and the LIFE Program is the second most numerous position with the result of 16%. It resulted from the fact that H2020 was one of the largest recent EU funding programs but also from the fact that the main search in the first collection period was conducted in the CORDIS repository, and in the second one – in both CORDIS and LIFE databases. In the next stages of the AgEnergy Platform creation, it is expected that the numbers of projects funded from EIP-AGRI and Interreg programs will significantly increase.

After the third collection period, Horizon 2020 remained the prevailing funding programme with 53.33% of all the published research projects. However, the share of other programmes increased significantly: as many as 15% of the published research projects on FEFTS were funded by the LIFE programme, and less numerous but also well represented Interreg (6.11%) and FP7 (3.89%). The second most numerous category (21.67%) constituted "other" funding programs, which comprise both EU (26 FEFTS) and national funds (7 FEFTS), as well as industry financing (2FEFTS), while two other projects were declared as self-funded by the coordinator. Figure 4 presents the distribution of project funding among different programmes.

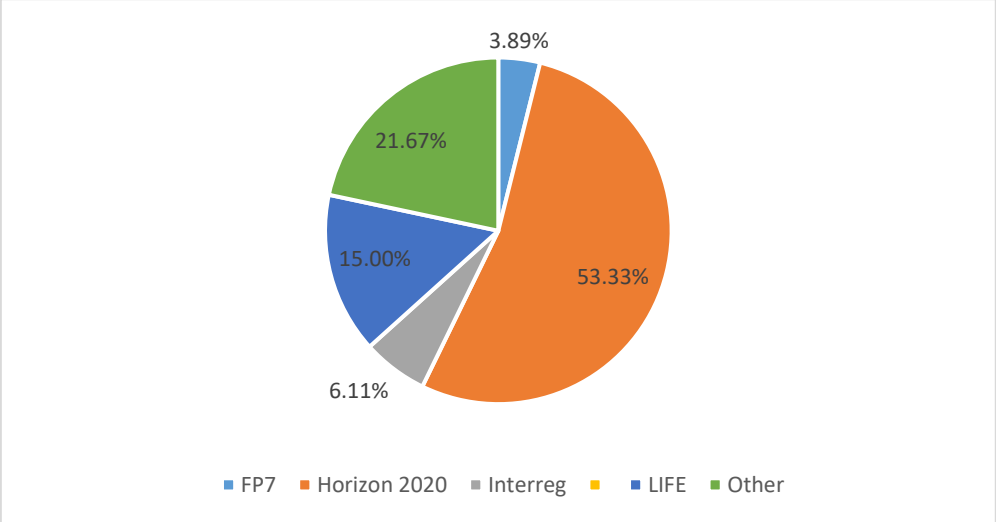

Figure 4. Distribution of project funding after the 3rd collection period

3. Projects' FEFTS Analysis

The selected projects comprise a wide range of FEFTS in terms of different types of solutions, types of clean energy sources, application field etc. This way we can ensure that the collected information will fulfil expectations of the AgEnergy Platform users and offer suitable solutions to various problems, depending on specific needs and capacity of each Platform user.

Below we present an analysis of the collected FEFTS based on their categorization. It is worth mentioning that the categorisation presented in this chapter may slightly diverge from the initial categorisation discussed in the first report on project results on FEFTS (Deliverable 2.5). The differences result from the fact that after first collection period, not all the FEFTS were assigned specific categories or their categories changed for more suitable after the screening

process conducted by the Screening Committee. Some categories were also changed with the aim to facilitate filtering/searching for specific FEFTS on the website. The analysis presented below is based on a current, corrected categorisation of FEFTS from all the collection periods.

As the main objective of the project is to move towards fossil energy free agriculture, all the FEFTS had to be related to clean energy supply or increased energy efficiency, or enable emissions reduction through soil carbon sequestration. After the first collection period, a large part of FEFTS remained uncategorized. The screening process allowed for their proper categorization and considerably changed the size of the "soil carbon sequestration" category. The **clean energy supply** category was still the most numerous as it collected 56 FEFTS in the first and 29 in the second collection period; 19 and 17 FEFTS respectively were devoted to **energy efficiency improvement,** however, another 24 (10 more than initially estimated) in the first and 16 in the second collection period allow for increased **soil carbon sequestration,** making it second most numerous (Figure 5).

After the third collection period, the clean energy supply category remained the most numerous, although it collected the same number of FEFTS as soil carbon sequestration (10 more FEFTS in each), while the energy efficiency improvement category gained only 3 more FEFTS and remained the least numerous, but still well represented. After all the three collection periods the clean energy production, soil carbon sequestration, and energy efficiency improvement collected respectively 93, 48, and 39 FEFTS. Distribution of FEFTS collected in each period is presented in figure 5.

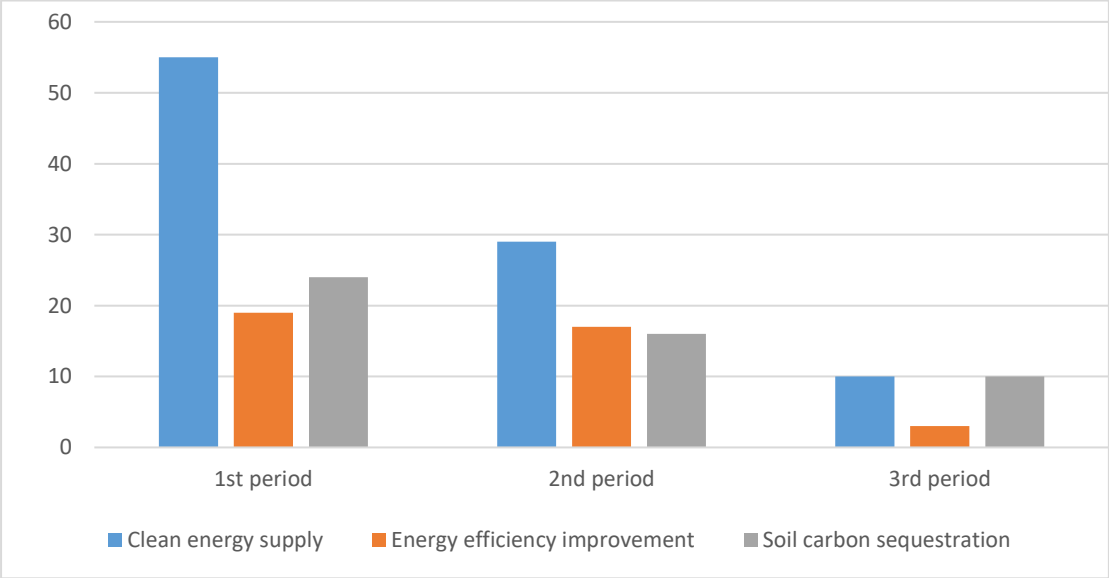

Figure 5. Classification of the FEFTS selected in all three collection periods, according to their type

The clean energy supply category constitutes more than half of all the collected research project FEFTS (51.67%). Since it is the largest category, it will be further sub-categorized for the purpose of this analysis in the next chapter.

When it comes to FEFTS' users to whom specific FEFTS are dedicated, **farmers** are the addressees of 177 out of 180 collected FEFTS, with as many as 55 FEFTS dedicated specifically to farmers (the numbers presented in the previous reports changed due to the revision of FEFTS categorization and continuous refining of data collected). This was expected as FEFTS were selected with the aim to bring benefits primarily to farmers and thus encourage adoption of fossil free solutions among this group. Other categories with significant numbers of dedicated FEFTS are industry (53 FEFTS), advisory services (46 FEFTS) and producer's associations (44 FEFTS). Many projects offer FEFTS dedicated to various groups of users, therefore, a multiple choice was possible in the case of this question. Specific numbers of FEFTS collected in each user category are presented in Figure 6.

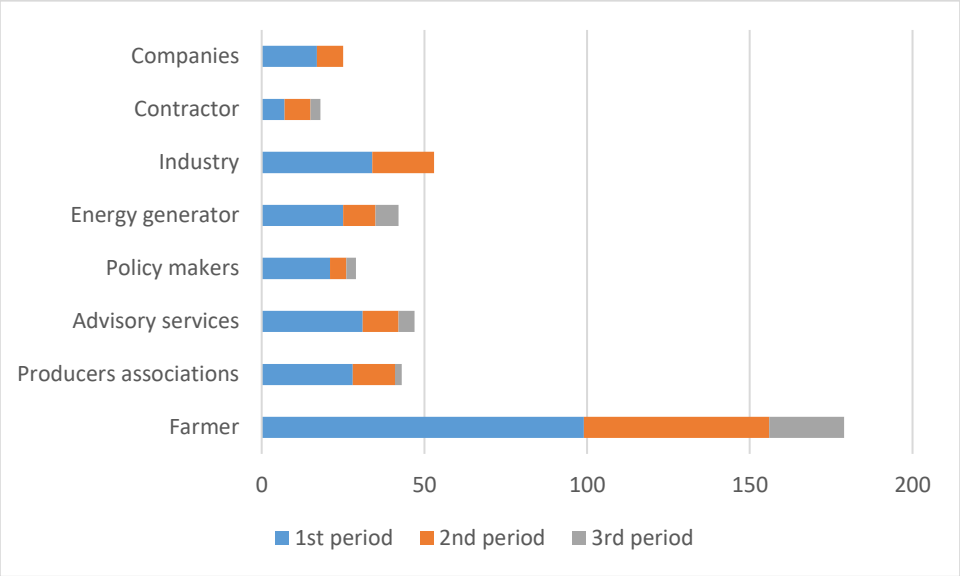

Figure 6. Classification of the research projects selected in all three collection periods, according to FEFTS' users addressed

All FEFTS were also divided into three categories depending on their application field in the context of agricultural activity (open field agriculture, livestock and greenhouses). A multiple choice of categories was possible also in this case. In each of the production periods, distribution of FEFTS among the three categories was similar, the largest group of FEFTS being dedicated to **open field** agricultural practices (153 FEFTS out of total), then **livestock farming** (101 FEFTS), and the least numerous group of FEFTS devoted to **greenhouses** (36 FEFTS). In all three collection periods, as many as 31 FEFTS could be applied in all three.

Figure 7 presents distribution of FEFTS among the three categories, starting from the most numerous (left) to the least numerous one (right).

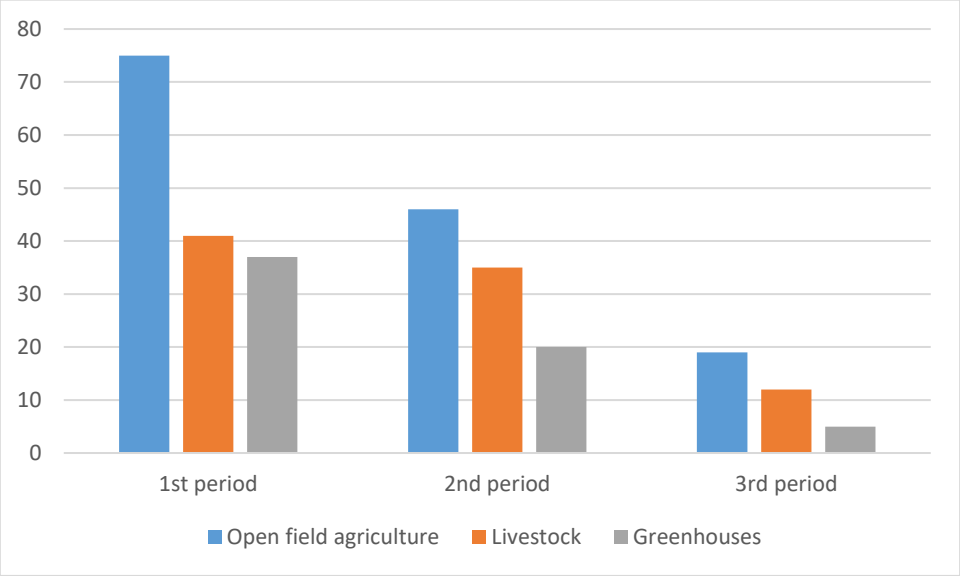

Figure 7. Classification of the FEFTS selected in all the collection periods, according to application field

The universality of collected FEFTS is well depicted in the first collection period by the categorization based on the agricultural application type (Figure 8). Almost half of the selected projects offer FEFTS with multiple application possibilities in a wide variety of agricultural activities.

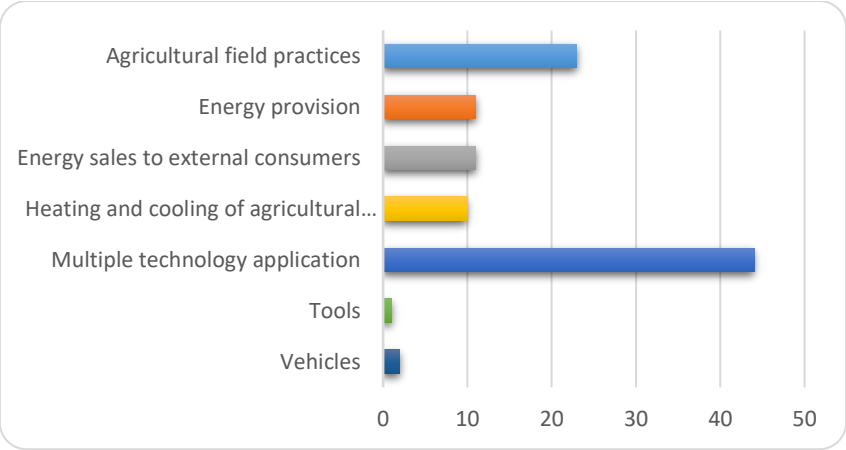

Figure 8. Classification of the research projects on FEFTS selected in the 1st collection period, according to FEFTS' application type

Later on, during the main screening process performed afterwards by the Screening Committee, the "**multiple technology application**" category has been further divided based on the most important/useful application among the many, and the "energy sales to external consumers" category has been incorporated into more general "energy provision". Moreover, the "Process heat/cold" category was added to differentiate purposes of heating/cooling used e.g. for ventilation and heating of agricultural buildings from the energy used for drying

cereals or storing produce. Still, a large group of FEFTS did not fall into any of these categories, and, therefore, the category of "other" application types had to be created. It is worth mentioning, however, that the "agricultural application" category allows for a multiple choice of applications now and hence the numbers of FEFTS selected in each collection period do not correspond to the total number of FEFTS representing each application category.

In the second collection period, distribution of FEFTS into the above categories was similar to the 1st batch, with agricultural field practices and energy provision still being the two most numerous. In the third collection period, this similarity continued regarding the categories of Agricultural field practices, energy provision, and heating and cooling of agricultural constructions. Figure 9 presents the distribution of FEFTS in all three collection periods, following to the revised categorisation.

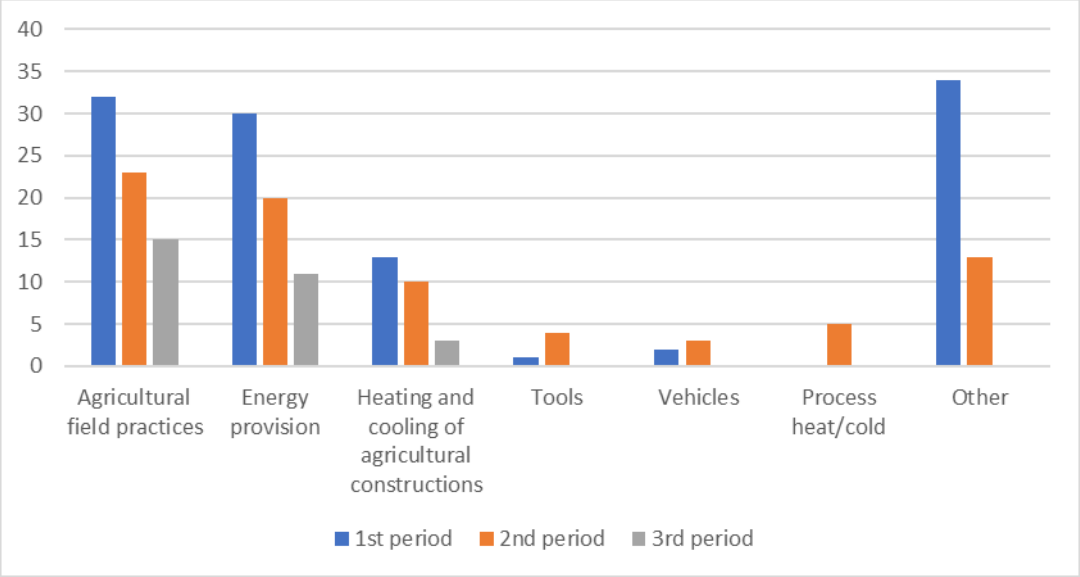

Figure 9. Classification of the FEFTS selected in all three collection periods, according to FEFTS' application type

When it comes to the specific area of fossil energy use reduction, in the repository of FEFTS built in the first collection period, the most numerous among the specific application areas was "Buildings' electricity consumption" with the result of 34 FEFTS, and the second most numerous application was "Tools and equipment's electricity consumption" with 32 FEFTS. These categories remained the most numerous after the second FEFTS collection period, however, in a reversed order, since the first collected only 12 new FEFTS and the latter 25 new FEFTS. Less numerous but also significant groups constituted "Tractors and vehicles' fuel consumption" and "Buildings' heat use" with 27 and 26 FEFTS after the first collection period, and 12 and 15 new FEFTS after the second, respectively. "Tools and equipment's fuel consumption" as well as "Buildings cooling needs" categories were less numerous, but also well represented: by 14 and 9 FEFTS, respectively. In the second collection period, the first category gained a much better representation (15 new FEFTS), and the latter was increased by 7 FEFTS. In the first collection period, a considerable group was made up by "Other" areas

of fossil energy use reduction, with examples such as “nutrient recycling”, “bioenergy production”, “pellets production”, to name a few. In the second collection period this group was less numerous, but also included interesting examples, such as “shifting energy consumption”, “holistic approach including renewable energy“ or “creating policy measures and transformation pathways to a sustainable energy system”. In the third collection period, the most numerous categories turned out to be “tractors and vehicles fuel production” with 10 new FEFTS, “tools and equipment electricity consumption” with 6 new FEFTS, and “tools and equipment fuel consumption” and “building heat use”, each with 5 new FEFTS. No “other” direct fossil energy use reduction options were identified in the 3rd batch of research projects on FEFTS. The final collection period has not changed the ranking of groups significantly - still the most numerous categories are devoted to electricity consumption: in tools and equipment ranked 1st and buildings electricity consumption ranked 3rd (addressed by as many as 111 FEFTS). The second most numerous category, however, constituted tractors and vehicles fuel consumption with 49 dedicated FEFTS. Buildings heat use was also well represented among the fossil-free solutions with as many as 46 FEFTS. Distribution of direct fossil energy free solutions in each collection period is presented in Figure 10.

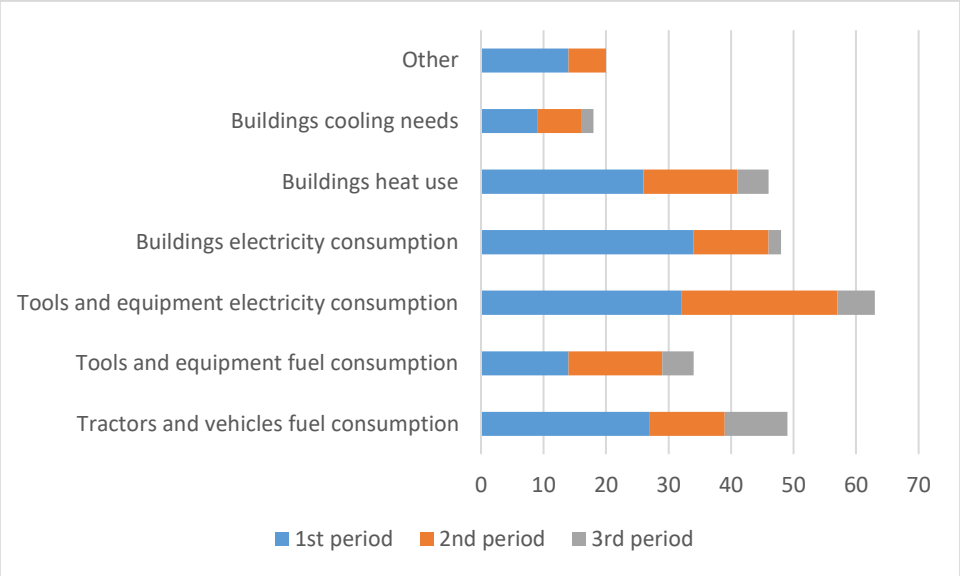

Figure 10. Classification of the research projects selected in all three collection periods, according to the area of fossil energy use reduction

Besides the above direct energy use reduction, many of the FEFTS collected in the 1st period offered also indirect fossil energy reduction possibilities, such as fertilizer use reduction (30 FEFTS), manure reduction (14 FEFTS), pesticide reduction (14 FETS) or tillage reduction (12 FEFTS). This trend continued in the second collection period, with a considerable number of 27 new FEFTS offering fertilizer reduction. The second most numerous category was animal healthcare with 9 new FEFTS, which considerably increased its previous size. However, manure reduction, pesticide reduction, and tillage reduction were also well represented in the second collection period, staying the most numerous FEFTS categories after the fertilizer reduction. In the third collection period, fertilizer reduction remained the most numerous indirect fossil energy reduction possibility, with as many as 15 FEFTS. Among other FEFTS collected in the final period, pesticide and manure reduction were represented by 3 FEFTS

each, followed by tillage/seed/feed reduction and animal healthcare with 1 FEFTS each. Categories of lime, water, and medicine reduction found no representing FEFTS in the final period of FEFTS collection, and remained the least numerous after all three collection periods.

The categorization shown in Figure 11 follows the results of D1.1 of AgroFossilFree, where fertilizers were found to have the biggest indirect energy consumption input in agriculture, whilst pesticides, manure and tillage, together with fertilizer, constitute the four basic pillars of indirect energy inputs.

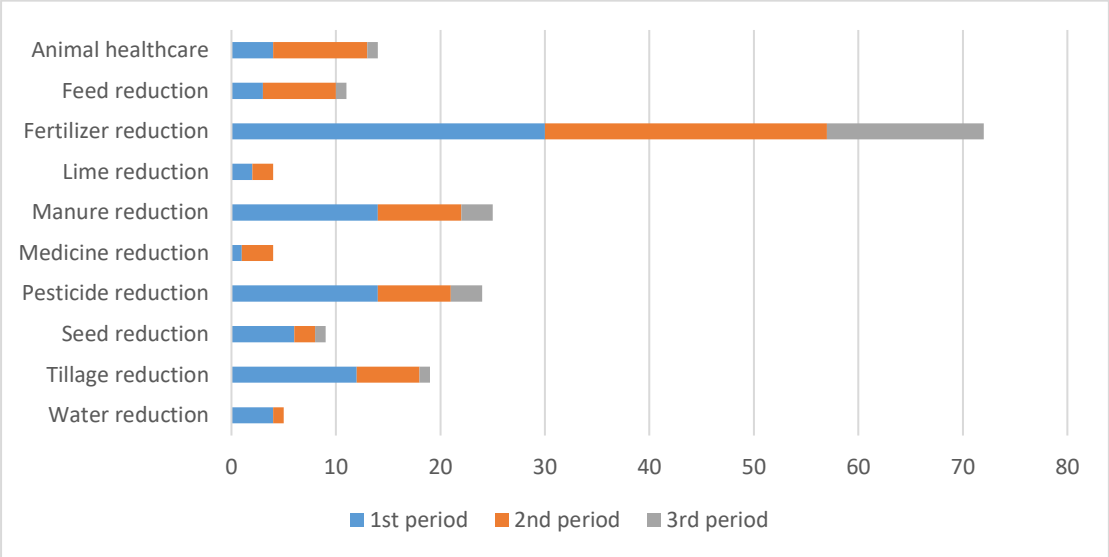

Figure 11. Classification of the research projects selected in all three collection periods, offering additional (indirect) fossil energy reduction possibilities

The selected research project results on FEFTS were also categorised according to the type of solution. In the first collection period, the three largest groups were methodology, complete solution, and hardware, with the respective results of 48, 44 and 38 FEFTS. In the second collection period, methodology remained the largest group with 37 new FEFTS, the second largest was complete solution category with 34 results, but the third largest turned out to be procedure with 20 new FEFTS, which made it also the third largest category after both collection periods. Hardware, however, remained well represented among all the collected FEFTS, with the joint result of 50 FEFTS. Software constituted the smallest group of selected FEFTS in both collection periods. There were also 4 FEFTS which could not be categorized based on the suggested types of solution. After the third and final collection period, methodology remained the most numerous category with 102 FEFTS (as many as 17 new FEFTS were gained in the 3rd collection period), followed by 85 FEFTS offering a complete solution and 52 FEFTS representing hardware, while procedures and software amounted to comparable results of 26 and 25 FEFTS, respectively (see figure 12). In the final collection period, no “other” types of solution were identified.

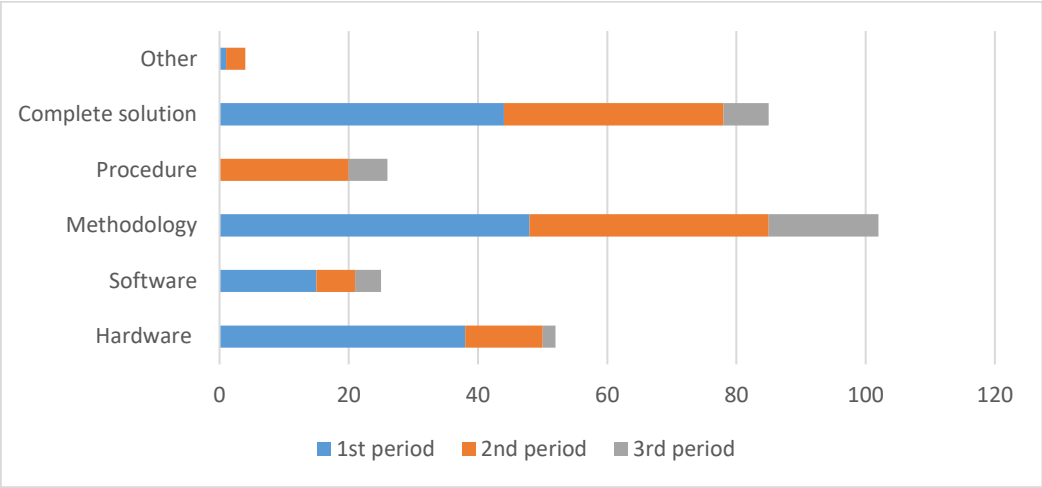

Figure 12. Classification of the FEFTS selected in all three collection periods, according to the type of solution

It is a fact that a proportion of research projects tend to present and analyze methodologies and procedures which are mostly dedicated to energy efficiency improvement and soil carbon sequestration purposes. On the other hand, the majority of the collected research projects are related to clean energy supply (Figure 5) where, most likely, either already complete solutions or hardware for producing green energy are proposed.

3.1. FEFTS types – clean energy supply

When it comes to clean energy supply, it can be further categorized into energy production or energy storage. Figure 13 shows a great disparity between those two categories, the energy production one being much more numerous in all three collection periods, and energy storage represented by only 5 FEFTS. It proves there is still lack of effective technologies for energy storage that could be used in agriculture.

When it comes to further categorization of FEFTS offering clean energy production, in the first collection period the largest group constituted FEFTS involving **solar energy** (22 FEFTS), then **biomass** (14 FEFTS), and **sewage treatment plant gas or biogas** (10 FEFTS). The high number of solar FEFTS projects may be explained by the fact that such solutions are becoming more popular and are universal hence possible to be applied also in agriculture, whilst more agriculture-specific solutions appear as well. The increased number of projects on biomass, biogas and waste treatment mostly matched our expectation, since biomass for energy production is highly available in agriculture and biogas plants often use input material from agriculture, such as energy crops, crop residues or manure.

In the second collection period, the number of FEFTS in the **biomass** category increased significantly (12 new FEFTS) reaching 26 records altogether, which allowed it to become the most numerous category, before the **solar** energy. The **sewage treatment plant gas and biogas** with 9 new FEFTS still remains the third most numerous category. It proves that these three energy sources are the most suitable and most available for agricultural purposes. In this collection period, no FEFTS were added in the wind, hydro, and aerothermal categories.

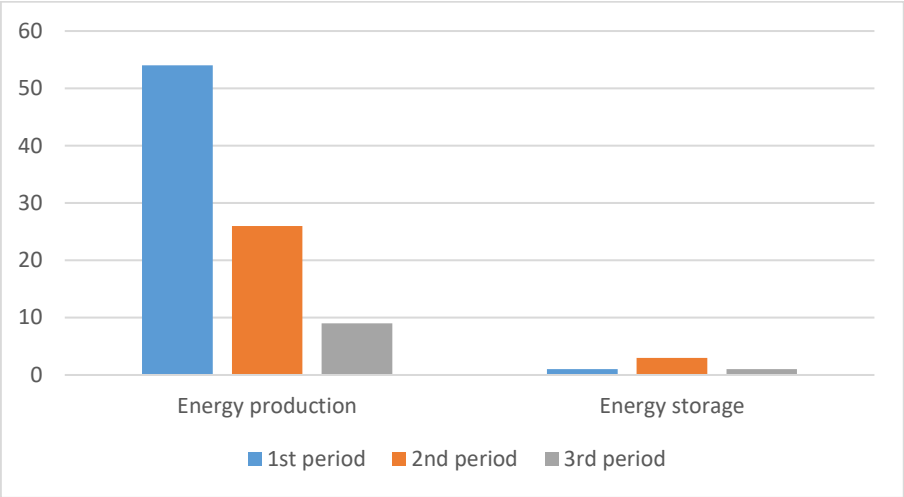

Figure 13. Classification of the FEFTS selected in all three collection periods, according to the type of clean energy supply

In the third and final FEFTS collection period, clean energy production comprised only 9 FEFTS, 4 of them belonging to the category of biomass, which remained the most numerous, and 3 to the category of sewage treatment plant gas and biogas. No further FEFTS were added in the categories of wind, solar, hydro and aerothermal energy sources.

Although the information on FEFTS presented on the Platform is continuously refined and categorization is being revised by the screening committee, after the final stage of FEFTS collection, there are still 4 FEFTS where the source of renewable energy could not be specified. They may regard universal solutions or pertain to RES as a group. The changes in category size after the final collection period are presented in Figure 14.

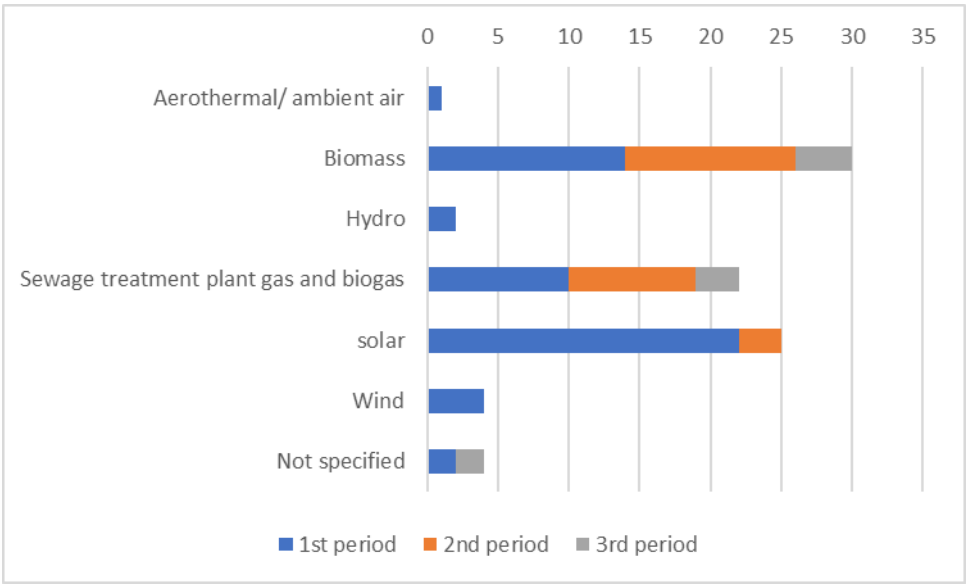

Figure 14. Classification of FEFTS after all three collection periods, according to clean energy sources

Within the clean energy supply category, the most numerous energy sources turned out to be solar (in the first collection period) and biomass (in the second and third collection period) – and those are further characterized below.

3.1.1. Solar energy

When it comes to **solar energy** source, the majority of FEFTS collected in the first period concern electricity production, while only 16% regard heat production. We should keep in mind, though, that only one type of energy produced could have been chosen in this category. Therefore, these results show that in 21 out of 25 FEFTS electricity production prevailed, yet some of the FEFTS may be suitable for both types of energy production. Both electricity and heat constitute a large share of energy types produced by the collected FEFTS, regardless of the energy source category.

In the second collection period, only 2 FEFTS were added to the category of solar energy source, yet it remained one of the two most numerous categories concerning renewable energy sources. Figure 15 presents the share of energy types produced from solar energy source.

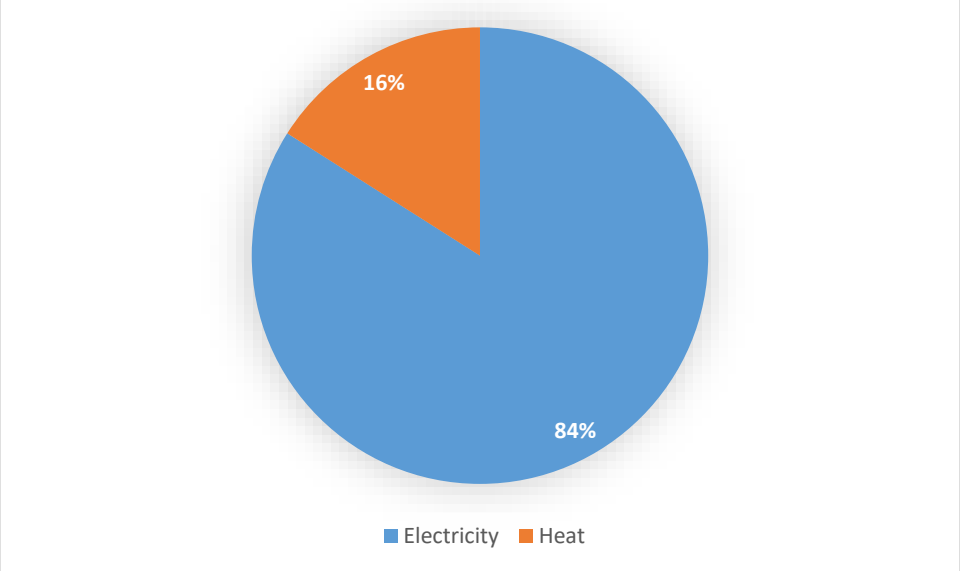

Figure 15. Classification of the FEFTS selected in the first and second collection period[6], according to the type of energy produced from solar energy source

Considering all the FEFTS categorized in this group both in the first and in the second collection period, almost all of them (23 FEFTS) involved photovoltaics as the main technology used for energy production, the two other ones being solar thermal energy production. Among the prevailing category, four groups could be distinguished: agri-PV systems (combined with agricultural production), PV on tools and vehicles, PV-arrays, and PV-panels (windows), which collected 9, 4, 4 and 3 FEFTS, respectively. There are 3 other FEFTS on unspecified type of photovoltaics, either due to their universality in this regard (2 unspecified types of FEFTS) and one described as PV panels floating on water. Figure 16 shows the categorization of FEFTS based on solar energy source, according to the technology used.

[6] no results from the 3rd collection period in this category

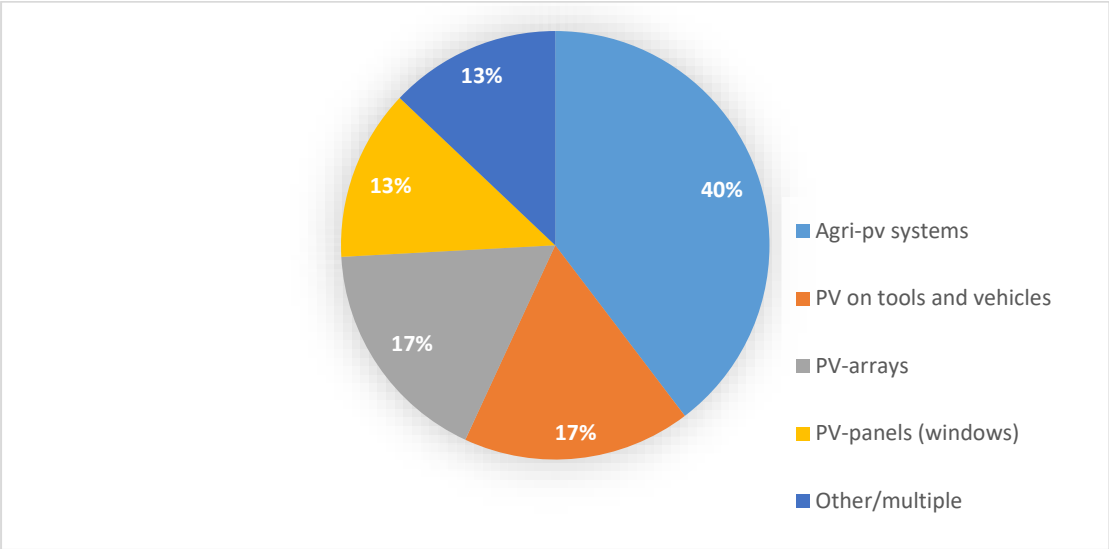

Figure 16. Classification of the FEFTS selected in the first and second collection period, according to the technology used for solar energy production[6]

Considering that the most numerous categories are agri-PV systems, PV arrays and PV on tools and vehicles, it can be concluded that most of the FEFTS constitute solutions that could be easily implemented in a wide variety of agricultural applications, or such that can be easily adjusted to specific agricultural purposes. However, the fact that PV-panels for windows were also found in this category proves that farmers can look for relevant solutions among more universal products already existing on the market.

3.1.2. Biomass

The second most numerous category regarding renewable energy sources of the first collection period, and the most numerous after second and third collection periods, was **biomass**. It collected the highest number of research results on FEFTS, namely 30 FEFTS altogether. When it comes to biomass available from agricultural sources, five categories have been identified: agricultural residues, energy crops, pellets, wood chips, and wood logs. In this category, a multiple choice of biomass sources was possible. The most numerous among them proved to be agricultural residues, which collected 22 FEFTS dedicated for this kind of biomass after all three collection periods, and the second most numerous were wood chips with 10 FEFTS collected. No FEFTS were added in the category of energy crops in the third collection period, so its result remained at 8 dedicated FEFTS. Categories such as pellets and wood logs were less numerous but in both cases their size doubled after the second collection period, amounting to 4 and 2 FEFTS, respectively. In the second collection period, 2 FEFTS appeared which could not be categorized based on the suggested types of biomass. Figure 17 presents categorization of FEFTS according to the type of biomass used for energy production.

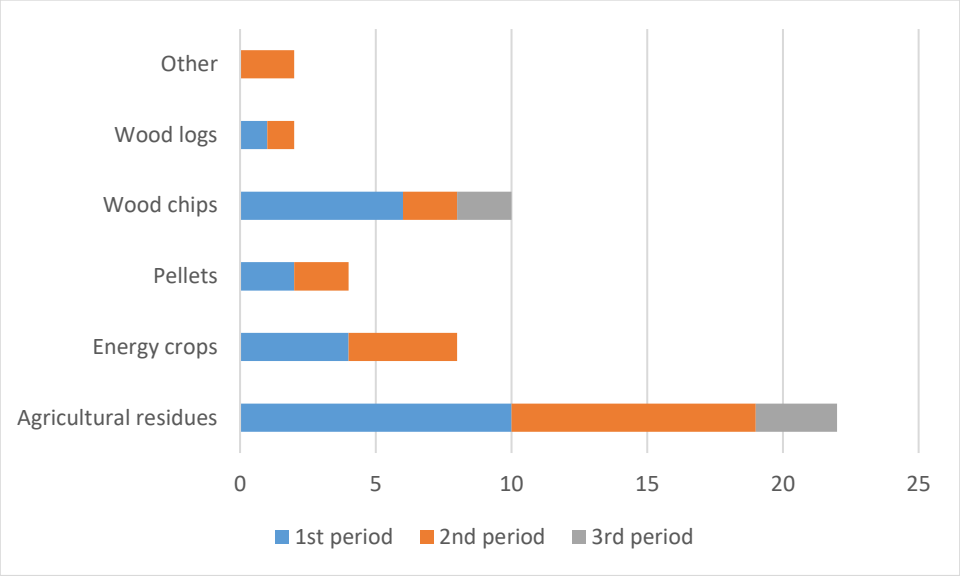

Figure 17. Classification of the FEFTS selected in all three collection periods, according to the type of biomass used for energy production

Such allocation of FEFTS is quite reasonable, since the most numerous categories constitute the largest sources of biomass at farmers' disposal. Such FEFTS, therefore, can have numerous potential applications in agriculture. However, agricultural farms with fruit shrubs and trees, or introducing woody perennials in a form of shelterbelts, may also find the other FEFTS quite useful, as they allow utilization of woody biomass or a combination of its several types.

When it comes to types of energy produced from biomass, the most numerous category in the first collection period was chemical energy constituting 50% of all FEFTS categorized in this regard. After the second reporting period, it constituted 42% of all the FEFTS in this category, but still remained the most numerous. In the third collection period, one more FEFTS was added to this category, giving the final result of 43%. Heat, on the other hand, which used to be least numerous at first, became the second-best represented category among the FEFTS related to energy production from biomass, with 5 more FEFTS after the second collection period, and 2 further FEFTS after the third one, which gave it the final result of 37% share in the biomass based FEFTS. The second most numerous category from the first collection period is now the third in size, namely, electricity production with the result of 4 FEFTS only. However, since the category did not allow for a multiple choice of energy types, in case of e.g. combined heat and electricity generators (CHP) it was necessary to choose the prevailing type, depending on its suggested/tested use, which does not exclude other types of energy production. Among the FEFST based on biomass utilization, two still remained uncategorized when it comes to the type of energy produced – which resulted from a universality of the solution and suggests they could increase any of the categories discussed.

Figure 18 presents categorization of FEFTS selected in all three collection periods, based on types of energy produced from biomass.

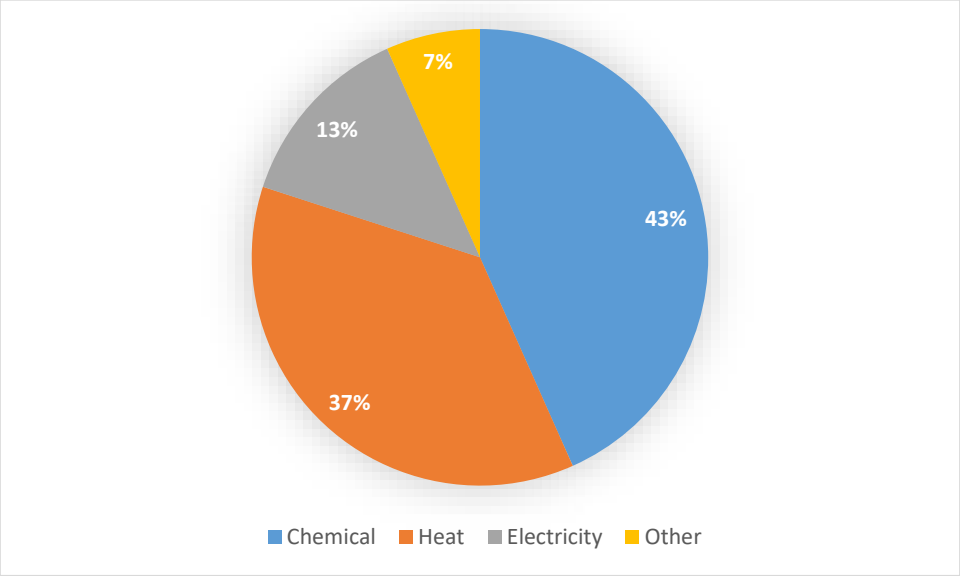

Figure 18. Classification of the FEFTS selected in all the collection periods, according to the type of energy produced from biomass

In case of chemical energy produced from biomass, the specific technologies used for energy production comprised mostly liquid biofuel production, biogas/biomethane production. In case of heat production, solid biomass conversion was the most often chosen technology. When it comes to electricity production, both solid biomass conversion and biogas/biomethane production technologies were involved.

3.2. FEFTS types – energy efficiency improvement

As it is presented in Figure 5, as many as 39 FEFTS are devoted to energy efficiency improvement. Among the represented energy efficient measures were: efficient tool with 15 collected FEFTS (most of them identified in the second collection period), precision agriculture with the result of 10 FEFTS (majority from the 1st collection period), efficient buildings with 5 FEFTS, precision livestock farming, efficient vehicle and conservation agriculture with only 2 results each. Only 3 FEFTS on energy efficiency improvement remained uncategorized as they offered other types of energy efficiency improvement. Distribution of FEFTS among the categories of specific energy efficiency improvement measures is presented in Figure 19.

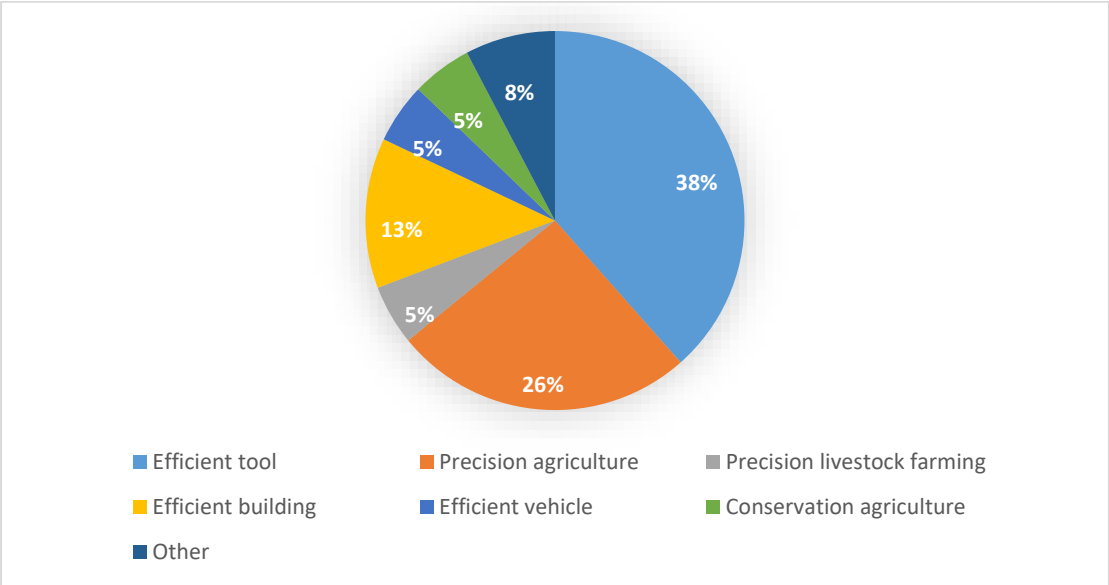

Figure 19. Classification of the FEFTS selected in all three collection periods, according to the specific measures of energy efficiency improvement

Among the efficient tools, there can be found solutions typically used in agriculture, such as: milking machines, refrigerators, sprayers, drying machines, but also monitoring systems, fast-heating microwaves, or efficient heating and cooling appliances. When it comes to the second most numerous category, namely precision agriculture, the highest number of FEFTS regards fertilization reduction, but there are also examples of pesticide, manure, and water reduction. The third in ranking, efficient building solutions, proposed building management systems, and wall insulation.

3.3. FEFTS types – Soil carbon sequestration

Soil carbon sequestration was the least numerous category of FEFTS types after the first collection period, but gained the second position after the second collection period with the result of 40 FEFTS, and remained ranked as second after the final collection period with the result of 48 FEFTS. Among the collected FEFTS on soil carbon sequestration, the most numerous were nutrient management practices, such as fertilizer and manure application) with 21 FEFTS, while 9 FEFTS were devoted to tillage, involving tillage reduction and controlled traffic farming. Number of FEFTS on grassland management amounted to 5 after the final collection period, soil organic matter collected 3 representative FEFTS, crop diversification 2 FEFTS and soil and water conservation techniques were still represented by 1 FEFTS only. When it comes to soil organic matter, methods of increasing its content in soil included: compost applications, incorporating harvest residues, or biochar production and application. Other categories of FEFTS on soil carbon sequestration did not involve further categorization of specific measures.

It is worth mentioning that although soil organic matter, and soil and water conservation were not numerous categories among the FEFTS specific to Soil carbon sequestration, they are still

well represented in the AgEnergy Platform repository as indirect fossil energy reduction possibilities, offered additionally by FEFTS from the other categories of Clean energy supply and Energy efficiency improvement. However, 7 FEFTS (constituting 15% of all FEFTS in the carbon sequestration category) still remained uncategorized which may be caused by the difficulty in identifying the prevailing option, since multiple choice was not possible in this category. Those FEFTS may offer universal solutions applicable to different carbon sequestration methods, but may also fall out of the scope of the suggested categories. Figure 20 presents categorization of selected FEFTS based on the specific measures of soil carbon sequestration.

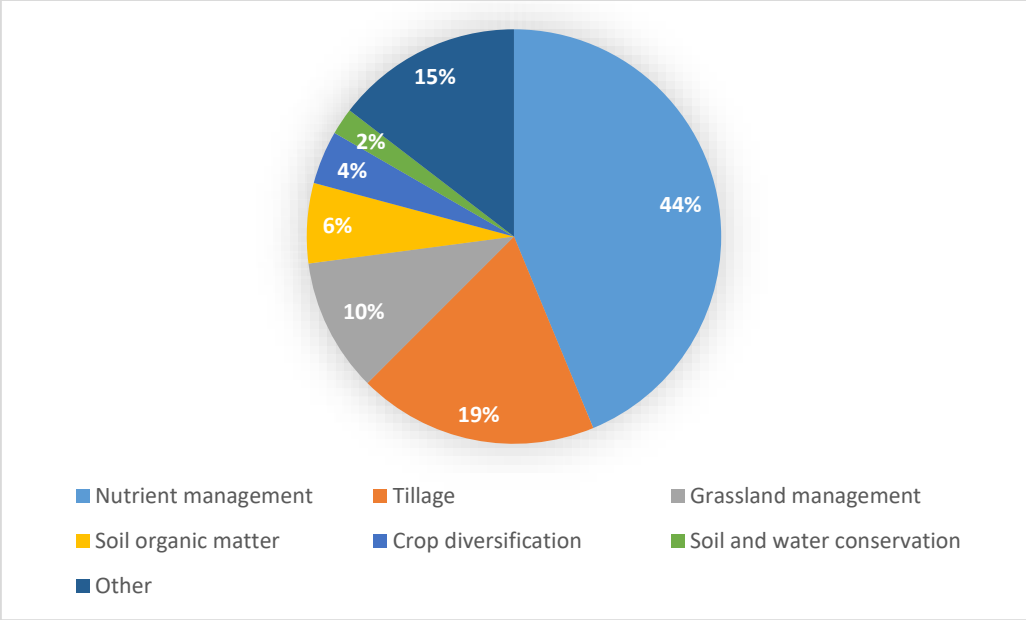

Figure 20. Classification of the selected FEFTS according to the specific measures of soil carbon sequestration

4. Conclusions

The first stage of identification of research projects on FEFTS was quite successful and provided satisfactory results, covering various categories and providing a wide range of solutions for fossil energy free agriculture. During the identification process, several improvements were introduced regarding the questionnaire for research projects submission that allowed for better categorization of identified FEFTS. However, the creation of the AgEnergy Platform is a continuous process that enabled not only enlarging the repository of FEFTS but also further improving the quality and availability of information to the future users of this tool. Analysis of the results collected in the first project period allowed for improvement of categorization of research project results – consisting e.g. of the incorporation of the "energy sales to external consumers" category into more general "energy provision", or a deletion of the "multiple technology application" category, which has been further divided based on its main application. The FEFTS collected in the 2nd and 3rd collection processes were categorized based on the amended rules. Still, in several categories discussed in the report some of the FEFTS remained uncategorized, as they offered universal solutions or other, falling out of the suggested scope.

Among the research projects identified during the project realization, the most numerous are English language projects and the major funding source is the Horizon 2020 research and innovation program, which is the main funding source of research projects in the last 10 years. Most of the collected projects are dedicated directly or indirectly to farmers and to improving the condition of agricultural environment in general. The most numerous among the presented solutions still are methodology, procedures, hardware and complete solutions, which may be used mainly in open field agriculture, but also in livestock farming and greenhouses. Many of the identified FEFTS can find multiple applications in agriculture. Implementation of those solutions may have a significant positive effect on the reduction of fossil energy use in tools and equipment electricity consumption, buildings' electricity and heat use or tractors and vehicles fuel consumption. Among the indirect methods of fossil energy reduction, the selected projects can influence fertilizer reduction to the highest extent.

Last but not least, the consortium worked as a unified partnership with all beneficiaries contributing with their maximum effort. We achieved 180 registered and approved by the Quality Committee research projects, which exceeded the target of 150 FEFTS, thanks to teamwork and the overall diverse contribution. Given the KPI of 1700 FEFTS (of any type) for our repository until the end of the project, both the initial goals that had been set and the vivid reaction of all partners, allowed for a successful completion of this task and exceeding the KPI by more than 250 FEFTS. Hopefully, this achievement will allow for further advancement in farming practices and contribute to the successful transformation towards the fossil energy free agriculture in Europe.

Annexes

In this section, the material used for the registration is provided in order to support what has been described in the above chapters.

Annex 1: Queries

Queries used for each RES category based on the corresponding keywords and filter options provided by CORDIS

Level 1 RES category	Level 2 sub-categories	CORDIS Query
Solar		contenttype='project' AND (programme/code='H2020' OR programme/code='FP7') AND startDate>=2007-01-01 AND (('agriculture' OR 'farming' OR 'farmer') AND 'energy' AND ('solar' OR 'photovoltaic'))
Wind		contenttype='project' AND (programme/code='H2020' OR programme/code='FP7') AND startDate>=2007-01-01 AND (('agriculture' OR 'farming' OR 'farmer') AND 'energy' AND 'wind')
Hydro		contenttype='project' AND (programme/code='H2020' OR programme/code='FP7') AND startDate>=2007-01-01 AND (('agriculture' OR 'farming' OR 'farmer') AND 'energy' AND 'hydro')
Biomass	Pellets	contenttype='project' AND (programme/code='H2020' OR programme/code='FP7') AND startDate>=2007-01-01 AND (('agriculture' OR 'farming' OR 'farmer') AND 'energy' AND 'biomass' AND 'pellets')
	Woodchips/ woodlogs	contenttype='project' AND (programme/code='H2020' OR programme/code='FP7') AND startDate>=2007-01-01 AND (('agriculture' OR 'farming' OR 'farmer') AND 'energy' AND 'biomass' AND (‘woodchip’ OR 'woodlog'))
	Energy crops	contenttype='project' AND (programme/code='H2020' OR programme/code='FP7') AND startDate>=2007-01-01 AND (('agriculture' OR 'farming' OR 'farmer') AND 'energy' AND 'biomass' AND 'energy crops')
	Agricultural residues	contenttype='project' AND (programme/code='H2020' OR programme/code='FP7') AND startDate>=2007-01-01 AND (('agriculture' OR 'farming' OR 'farmer') AND 'energy' AND 'biomass' AND 'agricultural residues')
Landfill gas		contenttype='project' AND (programme/code='H2020' OR programme/code='FP7') AND startDate>=2007-01-01 AND (('agriculture' OR 'farming' OR 'farmer') AND 'energy' AND 'landfill gas')
Biogas		contenttype='project' AND (programme/code='H2020' OR programme/code='FP7') AND startDate>=2007-01-01 AND (('agriculture' OR 'farming' OR 'farmer') AND 'energy' AND 'biogas')
Energy type	Heating	

Cooling	contenttype='project' AND programme/code='H2020','FP7' AND startDate>=2011-01-01 AND ('agriculture' AND 'farming' AND 'farmer' AND 'heating' OR 'cooling')
Energy storage	contenttype='project' AND (programme/code='H2020' OR programme/code='FP7') AND startDate>=2011-01-01 AND (('agriculture' OR 'farming' OR 'farmer') AND 'energy storage')
Energy saving/ energy efficiency	contenttype='project' AND (programme/code='H2020' OR programme/code='FP7') AND startDate>=2011-01-01 AND (('agriculture' OR 'farming' OR 'farmer') AND ('energy efficient' OR 'energy saving'))
Soil carbon sequestration	contenttype='project' AND (programme/code='H2020' OR programme/code='FP7') AND startDate>=2011-01-01 AND (('agriculture' OR 'farming' OR 'farmer') AND 'carbon sequestration')

Annex 2: Research Projects retrieved from survey – 1st collection period.

No	Project acronym	Project title
1	3Bee Hive-Tech	3Bee Hive-Tech
2	agrEE	Agriculture and Energy Efficiency
3	AGRI 4 POWER	For a sustainable future
4	agriCOlture	Livestock farming against climate change problems posed by soil degradation in the Emilian Apennines
5	Agri-PV	Agri-PV Insolight's demonstrator
6	AGROinLOG	Demonstration of innovative integrated biomass logistics centres for the Agro-industry sector in Europe
7	AgroRES	Investing in Renewable Energies for Agriculture
8	AgroStrat	Sustainable strategies for the improvement of seriously degraded agricultural areas: The example of Pistachia vera L.
9	AgrowFab (2018)	Far Infrared Radiation Smart Fabric Heating Element for GreenHouses
10	APV Obstbau	Agrophotovoltaics as a resilience concept for adapting to climate change in fruit growing
11	BABET-REAL5	New technology and strategy for a large and sustainable deployment of second generation biofuel in rural areas
12	BacBio	Mechanistic and functional studies of Bacillus biofilms assembly on plants, and their impact in sustainable agriculture and food safety
13	Bazydrill	Innovative technical solutions for grassland reseeding to improve quantity and quality of fodder for ruminants and to protect soil, water and climate.
14	BEST4SOIL	Boosting 4 BEST practices for SOIL health in Europe
15	BESTF3	Bioenergy Sustaining the Future (BESTF) 3
16	BioEcon	New Strategies on Bio-Economy in Poland
17	Biofrigas	Turning manure into fuel: a container based LBG plant for small to medium scale farms
18	BioFuel Fab	Biogas production from non-food lignocellulosic biomass waste
19	BIOGASTIGER	BIOGASTIGER® system – turning global organic waste streams into smart and clean energy
20	BioHotiTech	"Improved bio-inoculation and live plant mulching technologies for integrated horticultural crops"
21	BIOMAN	Economically efficient biogas production from manure fibres and straw
22	BioMet2020	BioMet2020
23	BioVill	Bioenergy Villages (BioVill) - Increasing the Market Uptake of Sustainable Bioenergy
24	biowave	Upscale and demonstration of a integrated novel microwave pre-treatment system for efficient production of biogas from anaerobic digestion of pig manure to create a sustainable waste management system
25	BISON	BIOMASS INTEGRATION FOR SYSTEM OPTIMISATION IN THE HÜMMLING ENERGY REGION
26	BoostCrop	Boosting Crop Growth using Natural Product and Synthesis Enabled Solar Harvesting

27	Citizen led-renovation	Citizen led-renovation
28	DualMetha	A cost-effective process for methanisation of unexploited agricultural waste.
29	Eciwind	Cost effective wind turbine of 40 kW of rated capacity
30	EKoTech	EKoTech project
31	Energy efficient straw boiler with low NOx emission	Energy efficient straw boiler with low NOx emission
32	ENORASIS	ENvironmental Optimization of IRrigAtion Management with the Combined uSe and Integration of High PrecisIon Satellite Data, Advanced Modeling, Process Control and Business Innovation
33	FLEXcoop	FLEXcoop
34	FTI Cocoon	Optimization of the production line of an innovative biodegradable water reservoir to be applied in efficient landscape-scale ecosystem restoration plans
35	Future Cropping	Future Cropping
36	GASFARM	SMALL-SCALE ANAEROBIC DIGESTION FOR AFFORDABLE, EFFICIENT AND SUSTAINABLE MANAGEMENT OF FARMS WASTE
37	GASMETRIC	New multi-parameter automaton for measurement of indoor environmental conditions in livestock exploitations
38	GRECO	Fostering a Next Generation of European Photovoltaic Society through Open Science
39	GREEN SHEEP	Demonstration and dissemination actions to reduce the carbon footprint in sheep farming
40	Green-DROP (2018-2020)	Precise subarea specific irrigation and fertilization system
41	GW-FortyForty (2016)	Gaia-Wind's Advanced Small Wind Turbine FortyForty
42	H2AD-aFDPI	Innovative and scalable biotechnology using Microbial Fuel Cell and Anaerobic Digestion for the treatment of micro-scale industrial and agriculture effluents to recover energy from waste
43	H2Agrar	Development of a green water supply for the agricultural region of Lower Saxony - Model Region Haren (Ems) / Emsland
44	HarvPell (2017)	Upscale and redesign of a mobile harvesting and pelletizing disruptive all-in-one machine
45	HyPErFarm	HYDROGEN AND PHOTOVOLTAIC ELECTRIFICATION ON FARM
46	HyPump (2016-2017)	Enabling Sustainable Irrigation through Hydro-Powered Pumps for Canals
47	HyPump (2017-2020)	Enabling Sustainable Irrigation through Hydro-Powered Pumps for Canals
48	ICaRE4Farms	Increase the capacity of Renewable Energies (RE) in Farms in the North West Europe Region by using Solar Thermal Energy
49	Impacts of Renewable Energy on European Farmers (2338 ID)	Impacts of Renewable Energy on European Farmers

50	INNOWIND (2018)	Low-cost and low-maintenance innovative mid-power horizontal axis wind turbine operable with low winds and small installation areas.
51	INSYLO	Disruptive IoT solution for optimising the animal feed supply chain
52	IoF2020	INTERNET OF FOOD & FARM 2020
53	ISAAC	Increasing Social Awarness and ACceptance of biogas and biomethane
54	KUDURA	Upscaling of a portable hybrid solution for power supply, smart waste-to-energy
55	AGROMITIGA	Development of climate change mitigation strategies through carbon-smart agriculture
56	GAIA Sense	Innovative Smart Farming services supporting Circular Economy in Agriculture
57	AGRICARBON	Sustainable agriculture in Carbon arithmetics
58	CLIMAGRI	Best agricultural practices for Climate Change: Integrating strategies for mitigation and adaptation
59	LIFT	Low-Input Farming and Territories Integrating knowledge for improving ecosystem-based farming
60	MacroFuels	Developing the next generation Macro-Algae based biofuels for transportation via advanced bio-refinery processes
61	MASLOWATEN	MArket uptake of an innovative irrigation Solution based on LOW WATer-ENergy consumption
62	MUBIC	Mushroom and biogas production in a circular economy
63	MYFOOD (2018)	An Innovative Smart Greenhouse System based on Aquaponics, Bioponics and Permaculture for Self-Production of Safe and Ultra-Fresh Food
64	N/A	Solar pumping for irrigation with solar trackers
65	NoAW	Innovative approaches to turn agricultural waste into ecological and economic assets
66	Olefine	Safe replacements for insecticides enabled by biotechnology
67	OPTIFERT (2011-2013)	Development of an automatic irrigation and fertilization system
68	PanePowerSW (2017)	Transparent Solar Panel Technology for Energy Autonomous Greenhouses and Glass Buildings
69	PanePowerSW (2020-2022)	Transparent Solar Panel Technology for Energy Autonomous Greenhouses
70	PELLETON	PELLETON – a device for production of pellets from biomass and agricultural waste for energy purposes
71	Poul-AR	Poultry manure valorization
72	Proxipel	Mobile pelletizing unit
73	PVCROPS	PhotoVoltaic Cost r€duction, Reliability, Operational performance, Prediction and Simulation
74	RES4LIVE	Energy Smart Livestock Farming towards Zero Fossil Fuel Consumption
75	RESFARM	Developing and implementing financial instruments for the mobilisation of investments in renewable energy in the agrarian sector
76	SEEMLA	Sustainable exploitation of biomass for bioenergy from marginal lands in Europe
77	SEFI	Solar Energy for Food Industry
78	SET-Nav	Navigating the Roadmap for Clean, Secure and Efficient Energy Innovation

79	SmartAgriHubs	Connecting the dots to unleash the innovation potential for digital transformation of the European agri-food sector
80	Smart-AKIS	Smart-AKIS: European Agricultural Knowledge and Innovation Systems (AKIS) towards innovation-driven research in Smart Farming Technology
81	Smartmushroom	Smart MAnagement of spent mushRoom subsTrate to lead the MUSHROOM sector towards a circular economy
82	SolAqua	Accessible, reliable and affordable solar irrigation for Europe and beyond
83	Solar-Win	Next generation transparent solar windows based on customised integrated photovoltaics
84	SPIRE	A Photovoltaic Plant with thermal co-generation
85	SPRHOUT (2018)	SPRHOUT (Solar PoweRed Horticultural Off-grid UniT) – the first economically viable off-grid energy system to power horticultural projects, boosting the transition towards sustainable food provision
86	SULTAN	SUstainabLe Tunnel Agriculture with light cascade techNology
87	SUN4GREEN (2015)	MAXIMISING SUNLIGHT RESOURCES FOR COST, ENERGY AND YIELD EFFICIENT GREENHOUSES
88	SUN4GREEN (2017-2019)	MAXIMISING SUNLIGHT RESOURCES FOR COST, ENERGY AND YIELD EFFICIENT GREENHOUSES
89	SUNINBOX (2015)	Portable SolUtioN for dIstributed geNeration in a BOX
90	SUNINBOX (2017)	Portable solar energy system powers rural development
91	sunlight2.0	Highly efficient, solar-powered irrigation pump
92	SWITLER (2016)	SWITLER: Small WInd Turbine Lightwight Efficient generatorR
93	SX1.3	Earth Observation by Autonomous Solar UAV
94	SYSTEMIC	SYSTEMIC - Circular solutions for biowaste
95	TheGreefa	Thermochemical fluids in greenhouse farming
96	TPX-Power	Waste Heat Recovery Through Near-Field Thermophotonics
97	uP_running (2016-2019)	Take-off for sustainable supply of woody biomass from agrarian pruning and plantation removal
98	Venturas (2018)	SMALL WIND ENERGY, A HIGHLY EXPLOITABLE RESOURCE
99	WASTE2WATTS	Unlocking unused bio-WASTE resources with loW cost cleAning and Thermal inTegration with Solid oxide fuel cells
100	WATERAGRI	"Water Retention And Nutrient Recycling In Soils And Streams For Improved Agricultural Production”
101	WiseGRID	WiseGRID
102	ZeoBio-NG	Innovative biogas upgrading system based on novel Zeolite adsorbent technology for producing Bio-based Natural Gas

Annex 3: Research Projects submitted to the AgEnergy Platform – 2nd collection period.

No	Project acronym	Project title
1	SAGRI	SAGRI – “Skills Alliance for Sustainable Agriculture"
2	PLANET	Erasmus Project PLANET Plan for Agriculture reNewable Energy Training
3	FIELDS	FIELDS – ANALYSIS OF SKILLS GAPS AND STRATEGIES FOR BIOECONOMY, DIGITALISATION AND SUSTAINABILITY
4	MilkGuard	A continuous milk disinfection system for calf feeding on-farm
5	ENFIR	ENergy efficient Far InfraRed process of manure valorisation
6	VALI	Conversion of manure to energy with the VALI solution
7	PROMETHEUS-5	Energy efficient and environmentally friendly multi-fuel power system with CHP capability, for stand-alone applications.
8	Drygair20	Energy efficient greenhouse dehumidifier for warm climate operating at wide temperature ranges (4-40° C) and free of fluorinated gases
9	inteGRIDy	integrated Smart GRID Cross-Functional Solutions for Optimized Synergetic Energy Distribution, Utilization Storage Technologies
10	ENTHALPY	Enabling the drying process to save energy and water, realising process efficiency in the dairy chain
11	ENREMILK	Integrated engineering approach validating reduced water and energy consumption in milk processing for wider food supply chain replication
12	greenGain	Supporting Sustainable Energy Production from Biomass from Landscape Conservation and Maintenance Work
13	SCOoPE	Saving COOPerative Energy
14	VegWaMus CirCrop	Developing commercial mushroom and vegetable production in an integrated food to waste to food biosystem.
15	Residue2Heat	Renewable residential heating with fast pyrolysis bio-oil
16	Schneeberger	IoT PTO Generators for Emergency Power Supply
17	DryCoolerSeeds	Optimum, sustainable solution for seed drying and conservation
18	REEEM	Role of technologies in an energy efficient economy – model-based analysis of policy measures and transformation pathways to a sustainable energy system
19	HACKS	Heating And Cooling Know-how and Solutions
20	ECO-LOGIC GREEN FARM	Design of an agricultural greenhouse for intensive growing of microalgae in fresh / seawater with a syngas production plant and organic farming of chickens and pigs outdoors.
21	AdD HyStor	Demonstration of dynamic grid stabilisation with an Adaptive-flywheel/battery Hybrid energy Storage system in Ireland and UK

22	CareSTOR	Market Uptake of Sustainable and Competitive Carbons for Energy Storage
23	Circular Agronomics	Efficient Carbon, Nitrogen and Phosphorus cycling in the European Agri-food System and related up- and down-stream processes to mitigate emissions
24	H3O	Healthy crop, Healthy environment, Healthy finances ... through Optimization
25	AgriCloud P2	Demonstration of a cloud-based precision farming management system for a sustainable and intensive agriculture to secure long-term food supply in Europe - Phase II
26	MobiLab	Development of a mobile device for the quick on-site measurement of soil nutrients
27	MobiLab	Development of a mobile device for the quick on-site measurement of soil nutrients
28	Nutri2Cycle	Transition towards a more carbon and nutrient efficient agriculture in Europe
29	HybridFarm	Eco-innovative housing solution for efficient production of slaughterpigs with limited environmental impact.
30	BBFB	Biomass to Biochar for Farm Bioeconomy
31	C-HEAT	Condensed Heat - Optimization and scaling up of an energy efficient, long-during biomass condensation boiler with curved heat exchanger
32	MAIL	Identifying Marginal Lands in Europe and strengthening their contribution potentialities in a CO2 sequestration strategy
33	SOILCARE	Soil Care for profitable and sustainable crop production in Europe
34	LIFE AMIA	INNOVATIVE COMBINATION OF WWT TECHNOLOGIES FOR WATER REUSE: ANAEROBIC-AEROBIC, MICROALGAE AND AOP PROCESSES
35	LIFE STO3RE	Synergic TPAD and O3 process in WWTPs for Resoruce Efficient waste management
36	LIFE PRIORAT+MONTSANT	Efficiency in the use of resources for the improvement of sustainability of vine and wine sector at Priorat region
37	LIFE LEMNA	DUCKWEED TECHNOLOGY FOR IMPROVING NUTRIENT MANAGEMENT AND RESOURCE EFFICIENCY IN PIG PRODUCTION SYSTEMS
38	MATCH	Smart Energy for the End-User: A Feasibility Study from Samso, Denmark
39	LIFE DOP	Demonstrative mOdel of circular economy Process in a high quality dairy industry
40	LIFE+ REWIND	PROFITABLE SMALL SCALE RENEWABLE ENERGY SYSTEMS IN AGRIFOOD INDUSTRY AND RURAL AREAS: DEMONSTRATION IN THE WINE SECTOR.
41	LIFE VINEYARDS4HEAT	Vineyards for carbon footprint reduction: a sustainable strategy to use biomass for heat & cold in wineries.
42	LIFE - F3	LIFE Farm, Fresh Fruit
43	Life+ ClimAgri	Best agricultural practices for Climate Change: Integrating strategies for mitigation and adaptation

44	LIFE+Farms for the future	Farms for the future: Innovation for sustainable manure management from farm to soil
45	LIFE-Dairyclim	Feeding strategies to decrease methane emissions and carbon footprint of dairy cows in Belgium, Luxembourg and Denmark
46	LIFE WINEgROVER	Precision Agriculture System to limit the impact on the environment, on health and on air quality of grape production.
47	LIFE+ VALPORC	Valorization of pig carcasses through their transformation into biofuels and organic fertilizers
48	LIFE LiveAdapt	Adaptation to Climate Change of Extensive Livestock Production Models in Europe
49	AgroCycle	Sustainable techno-economic solutions for the agricultural value chain (AgroCycle)
50	CONVERGE	CarbON Valorisation in Energy-efficient Green fuels
51	AgroRes	Agro Res
52	ICaRE4Farms project	Supporting Solar Thermal Energy on the farm
53	Webinar	Research Insights Webinar
54	FarmZeroC	Farm Zero C
55	LIFE VineAdapt	Sustainable Viticulture for Climate Change Adaptation
56	LIFE agriCOlture	Livestock farming against climate change problems posed by soil degradation in the Emilian Apennines
57	OLIVE4CLIMATE - LIFE	OLIVE4CLIMATE - LIFE. CLIMATE CHANGE MITIGATION THROUGH A SUSTAINABLE SUPPLY CHAIN FOR THE OLIVE OIL SECTOR
58	BIOWILL	BioWILL - An Integrated Zero Waste Biorefinery
59	LIFE_FERTILIFE	Development and implementation of a result-based funding mechanism for carbon farming in EU mixed crop livestock systems
60	LIFE SEED CAPITAL	INTEGRAL USE OF OIL SEEDS TO REDUCE GREEN HOUSE GASES EMISSIONS ASSOCIATED WITH FARMING ACTIVITIES
61	LIFE-CO2-INT-BIO	CO2 emissions reduction by industrial integration and value chains creation
62	LIFE BEEF CARBON	Demonstration actions to mitigate the carbon footprint of beef production in France, Ireland, Italy and Spain

Also, the link for the online spreadsheet that contains all the information of the FEFTS on Research Projects gathered from the 1st and 2nd collection processes is presented here.

https://docs.google.com/spreadsheets/d/1NU4J08GXusngT8PT_qUesEPjEhSbhl2kRDV4jbA8T0Y/edit#gid=904253802

Annex 4: Research Projects Survey

As it has been mentioned in the report, with the official launch of the AgEnergy platform, the use of the Google forms survey has been discontinued. Instead, all interested users can now access the platform and add their FEFTS directly by simple creating a free account. The following link is the link to the AgEnergy platform.

https://platform.agrofossilfree.eu/en

Annex 5: Research projects presented on the AgEnergy Platform after the 3rd collection period (final repository after screening performed by the Quality Committee)

Item no.	ID	English title	Project acronym	Project funding type	Project coordinator	Coordinator's country
1	1	Demonstration and dissemination actions to reduce the carbon footprint in sheep farming	GREEN SHEEP	EU	Sindy Moreau	Europe
2	2	Livestock farming against climate change problems posed by soil degradation in the Emilian Apennines	agriCOlture	EU	Aronne Ruffini	Europe
3	3	Portable solar energy system powers rural development	SUNINBOX	EU	SOLARBOX SOLAR SOLUTIONS SL	Europe
4	10	Water Retention And Nutrient Recycling In Soils And Streams For Improved Agricultural Production	WATERAGRI	EU	Prof. Miklas Scholz	Sweden
5	37	Maximising sunlight resources for cost, energy and yield efficient greenhouses.	SUN4GREEN (2015)	EU	RUFEPA TECNOAGRO, S.L.	Spain
6	78	Hydrogen and photovoltaic electrification on farm.	HyPErFarm	EU	KATHOLIEKE UNIVERSITEIT LEUVEN	Belgium
7	79	MArket uptake of an innovative irrigation Solution based on LOW WATer-ENergy consumption	MASLOWATEN	EU	UNIVERSIDAD POLITECNICA DE MADRID, Luis Narvarte Fernandez UPM, Solar Energy Institute	Spain
8	80	MAXIMISING SUNLIGHT RESOURCES FOR COST, ENERGY AND YIELD EFFICIENT GREENHOUSES	SUN4GREEN (2017-2019)	EU	RUFEPA TECNOAGRO, S.L.	Spain
9	83	Accessible, reliable and affordable solar irrigation for Europe and beyond	SolAqua	EU	UNIVERSIDAD POLITECNICA DE MADRID	Spain
10	84	Disruptive IoT solution for optimising the animal feed supply chain	INSYLO	EU	INSYLO TECHNOLOGIES SLU	Spain
11	85	Low-cost and low-maintenance innovative mid-power horizontal axis wind turbine operable with low winds and small installation areas.	INNOWIND (2018)	EU	Sistema Eólico Morcillo S.L.	Spain

12	86	Fostering a Next Generation of European Photovoltaic Society through Open Science	GRECO	EU	UNIVERSIDAD POLITECNICA DE MADRID, Dr. Ana Belén Cristóbal López	Spain
13	87	A Photovoltaic Plant with thermal co-generation	SPIRE	EU	CAPSUN TECHNOLOGIES SL	Spain
14	88	Next generation transparent solar windows based on customised integrated photovoltaics	Solar-Win	EU	FUNDACIO INSTITUT DE RECERCA DE L'ENERGIA DE CATALUNYA	Spain
15	89	Solar Energy for Food Industry	SEFI	EU	GREENETICA GMBH	Austria
16	90	Highly efficient, solar-powered irrigation pump	sunlight2.0	EU	ENNOS AG	Switzerland
17	91	Enabling Sustainable Irrigation through Hydro-Powered Pumps for Canals	HyPump (2016-2017)	EU	AQYSTA HOLDING BV	Netherlands
18	92	Enabling Sustainable Irrigation through Hydro-Powered Pumps for Canals	HyPump (2017-2020)	EU	AQYSTA HOLDING BV	Netherlands
19	93	PhotoVoltaic Cost r€duction, Reliability, Operational performance, Prediction and Simulation	PVCROPS	EU	UNIVERSIDAD POLITECNICA DE MADRID	Spain
20	94	Thermochemical fluids in greenhouse farming	TheGreefa	EU	ZURCHER HOCHSCHULE FUR ANGEWANDTE WISSENSCHAFTEN (Dr. Thomas Bergmann)	Switzerland
21	95	Transparent Solar Panel Technology for Energy Autonomous Greenhouses	PanePowerSW (2020-2022)	EU	BRITE HELLAS SA	Greece
22	96	Transparent Solar Panel Technology for Energy Autonomous Greenhouses and Glass Buildings	PanePowerSW (2017)	EU	BRITE HELLAS SA	Greece
23	97	Boosting 4 BEST practices for SOIL health in Europe	BEST4SOIL	EU	DELPHY BV	Netherlands
24	98	ENvironmental Optimization of IRrigAtion Management with the Combined uSe and Integration of High PrecisIon Satellite Data, Advanced Modeling, Process Control and Business Innova	ENORASIS	EU	DRAXIS ENVIRONMENTAL SA	Greece
25	99	New multi-parameter automaton for measurement of indoor environmental conditions in livestock exploitations	GASMETRIC	EU	GASMETRIC AUTOMATAS DE MEDICION SOCIEDAD LIMITADA	Spain
26	100	Waste Heat Recovery Through Near-Field Thermophotonics	TPX-Power	EU	AALTO KORKEAKOULUSAATIO SR	Finland

27	101	Developing the next generation Macro-Algae based biofuels for transportation via advanced bio-refinery processes	MacroFuels	EU	TEKNOLOGISK INSTITUT (prof. Anne-Belinda Bjerre)	Denmark
28	102	New technology and strategy for a large and sustainable deployment of second generation biofuel in rural areas	BABET-REAL5	EU	INSTITUT NATIONAL POLYTECHNIQUE DE TOULOUSE (Gérard Vilarem)	France
29	104	Cost effective wind turbine of 40 kW of rated capacity	Eciwind	EU	LANCOR 2000 S COOP	Spain
30	105	Navigating the Roadmap for Clean, Secure and Efficient Energy Innovation	SET-Nav	EU	TECHNISCHE UNIVERSITAET WIEN	Austria
31	108	SUstainabLe Tunnel Agriculture with light cascade techNology	SULTAN	EU	CASCADE	France
32	110	Mechanistic and functional studies of Bacillus biofilms assembly on plants, and their impact in sustainable agriculture and food safety	BacBio	EU	UNIVERSIDAD DE MALAGA	Spain
33	111	Boosting Crop Growth using Natural Product and Synthesis Enabled Solar Harvesting	BoostCrop	EU	THE UNIVERSITY OF WARWICK	United Kingdom
34	112	SPRHOUT (Solar PoweRed Horticultural Off-grid UniT) – the first economically viable off-grid energy system to power horticultural projects, boosting the transition towards sustainable food provision	SPRHOUT (2018)	EU	SOLHO B.V.	Netherlands
35	113	Far Infrared Radiation Smart Fabric Heating Element for GreenHouses	AgrowFab (2018)	EU	SAN HITECH LTD	Israel
36	114	An Innovative Smart Greenhouse System based on Aquaponics, Bioponics and Permaculture for Self-Production of Safe and Ultra-Fresh Food	MYFOOD (2018)	EU	MYFOOD FRANCE	France
37	115	Earth Observation by Autonomous Solar UAV	SX1.3	EU	XSUN	France
38	116	Optimization of the production line of an innovative biodegradable water reservoir to be applied in efficient landscape-scale ecosystem restoration plans	FTI Cocoon	EU	FGW FASERGUSSWERK POLENZ GMBH	Germany
39	117	3Bee Hive-Tech	3Bee Hive-Tech	EU	3BEE SRL	Italy
40	118	Developing and implementing financial instruments for the mobilisation of investments in renewable energy in the agrarian sector	RESFARM	EU	UNIONS AGRARIAS UPA	Spain

41	119	Increasing Social Awareness and Acceptance of biogas and biomethane	ISAAC	EU	AZZERO CO2 SRL	Italy
42	121	Sustainable exploitation of biomass for bioenergy from marginal lands in Europe	SEEMLA	EU	FACHAGENTUR NACHWACHSENDE ROHSTOFFE EV (Diego Piedra-Garcia)	Germany
43	123	Gaia-Wind's Advanced Small Wind Turbine FortyForty	GW-FortyForty (2016)	EU	GAIA-WIND LIMITED	United Kingdom
44	126	Take-off for sustainable supply of woody biomass from agrarian pruning and plantation removal	uP_running (2016-2019)	EU	FUNDACION CIRCE CENTRO DE INVESTIGACION DE RECURSOS Y CONSUMOS ENERGETICOS (Daniel Garcia Galindo Fundación CIRCE)	Spain
45	127	Development of an automatic irrigation and fertilization system	OPTIFERT (2011-2013)	EU	VEREIN ZUR FORDERUNG DES TECHNOLOGIETRANSFERS AN DER HOCHSCHULE BREMERHAVEN EV	Germany
46	128	Precise subarea specific irrigation and fertilization system	Green-DROP (2018-2020)	EU	HYDRO-AIR INTERNATIONAL IRRIGATION SYSTEMS GMBH	Germany
47	140	EKoTech - Efficient fuel utilisation of agricultural machinery	EKoTech	Industry	VDMA Agricultural Machinery	Germany
48	141	Agriculture and Energy Efficiency	agrEE	EU	Fachagentur Nachwachsende Rohstoffe	Germany
49	142	Connecting the dots to unleash the innovation potential for digital transformation of the European agri-food sector	SmartAgriHubs	EU	Stichting Wageningen Research	Netherlands
50	143	Bioenergy Villages (BioVill) - Increasing the Market Uptake of Sustainable Bioenergy	BioVill	EU	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH	Germany
51	151	New Strategies on Bio-Economy in Poland	BioEcon	EU	INSTYTUT UPRAWY NAWOZENIA I GLEBOZNAWSTWA, PANSTWOWY INSTYTUT	Poland

					BADAWCZY (Wiesław Oleszek)	
52	155	Mobile pelletizing unit	Proxipel	EU	PROXIPEL SA (RICHARD PFISTER)	Switzerland
53	156	Upscale and redesign of a mobile harvesting and pelletizing disruptive all-in-one machine	HarvPell (2017)	EU	SCM PRODUKTIONS- UND VERTRIEBS GMBH	Austria
54	325	Increase the capacity of Renewable Energies (RE) in Farms in the North West Europe Region by using Solar Thermal Energy	ICaRE4Farms	EU	Laval Mayenne Technopole	France
55	329	Energy Smart Livestock farming towards zero fossil fuel consumption	RES4LIVE	EU	Agricultural University of Athens	Greece
56	350	HYBRID PHOTOVOLTAICS FOR EFFICIENCY RECORD USING INTEGRATED OPTICAL TECHNOLOGY	HIPERION	Industry	Insolight	Switzerland
57	407	For a sustainable future	AGRI 4 POWER	National	Fraunhofer IMW	Germany
58	408	BIOMASS INTEGRATION FOR SYSTEM OPTIMISATION IN THE HÜMMLING ENERGY REGION	BISON	National	FNR	Germany
59	426	Demonstration of innovative integrated biomass logistics centres for the Agro-industry sector in Europe	AGROinLOG	EU	FUNDACION CIRCE CENTRO DE INVESTIGACION DE RECURSOS Y CONSUMOS ENERGETICOS	Spain
60	427	Innovative approaches to turn agricultural waste into ecological and economic assets	NoAW	EU	INSTITUT NATIONAL DE RECHERCHE POUR L'AGRICULTURE, L'ALIMENTATION ET L'ENVIRONNEMENT (Prof. Nathalie Gontard (INRA)- Project Coordinator)	France
61	429	Upscale and demonstration of an integrated novel microwave pre-treatment system for efficient production of biogas from anaerobic digestion of pig manure to create a sustainable waste management system	Biowave	EU	ASHLEIGH FARMS (ENVIRONMENTAL) LIMITED	Ireland
62	431	WiseGRID	WiseGRID	EU	ETRA	Spain

63	432	Citizen led-renovation	Citizen led-renovation	EU	REScoop.eu	Belgium
64	433	FLEXcoop	FLEXcoop	EU	Fraunhofer FOKUS	Germany
65	452	Upscaling of a portable hybrid solution for power supply, smart waste-to-energy	KUDURA	EU	RVE.SOL - SOLUCOES DE ENERGIA RURAL LDA	Portugal
66	453	Turning manure into fuel: a container based LBG plant for small to medium scale farms	Biofrigas	EU	BIOFRIGAS SWEDEN AB	Sweden
67	455	Mushroom and biogas production in a circular economy	MUBIC	EU	ADVANCED SUBSTRATE TECHNOLOGIES AS	Denmark
68	523	Safe replacements for insecticides enabled by biotechnology	Olefine	EU	Markus Herrgård	Denmark
69	524	SYSTEMIC - Circular solutions for biowaste	SYSTEMIC	EU	STICHTING WAGENINGEN RESEARCH	Netherlands
70	526	Low-Input Farming and Territories Integrating knowledge for improving ecosystem-based farming	LIFT	EU	Laure Latruffe	France
71	572	Solar pumping for irrigation with solar trackers	Solar pumping for irrigation with solar trackers	Self funded	Gamo Energías	Spain
72	596	Future Cropping	Future Cropping	National	Professor Thomas S. Toftegaard, Aarhus University	Denmark
73	601	Energy efficient straw boiler with low NOx emission	Energy efficient straw boiler with low NOx emission	Industry	Erik Fløjgaard Kristensen	Denmark
74	606	INTERNET OF FOOD & FARM 2020	IoF2020	EU	Dr. ir. George Beers	Netherlands
75	610	Impacts of Renewable Energy on European Farmers	2338 (ID)	EU	Katharina Umpfenbach	Germany
76	634	Development of climate change mitigation strategies through carbon-smart agriculture	LIFE AGROMITIGA	EU	Oscar Veroz-González	Spain
77	635	Smart MAnagement of spent mushRoom subsTrate to lead the MUSHROOM sector towards a circular economy	Smartmushroom	EU	ASOCIACION PROFESIONAL DE PRODUCTORES DE SUSTRATOS Y HONGOS DE LA RIOJA NAVARRA Y ARAGON (ASOCHAMP-CTICH)	Spain

78	636	Best agricultural practices for Climate Change: Integrating strategies for mitigation and adaptation	LIFE+CLIMAGRI	EU	Emilio GOnzález-Sánchez	Spain
79	646	Sustainable agriculture in Carbon arithmetics	LIFE+ AGRICARBON	EU	Emilio González-Sánchez	Spain
80	656	Unlocking unused bio-WASTE resources with loW cost cleAning and Thermal inTegration with Solid oxide fuel cells	WASTE2WATTS	EU	ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE	Switzerland
81	679	Agrophotovoltaics as a resilience concept for adapting to climate change in fruit growing	APV Obstbau	Industry	Andreas Steinhüser	Germany
82	681	Development of a green water supply for the agricultural region of Lower Saxony - Model Region Haren (Ems) / Emsland	H2Agrar	National	Anna Benjamins	Germany
83	683	BioMet2020	BioMet2020	National	Petri Soderena	Finland
84	689	Innovative technical solutions for grassland reseeding to improve quantity and quality of fodder for ruminants and to protect soil, water and climate.	Bazydrill	EU	dr hab. Halina Lipińska, prof. of the University	Poland
85	696	Improved bio-inoculation and live plant mulching technologies for integrated horticultural crops	BioHotiTech	EU	Magdalena Szczech	Poland
86	698	Smart-AKIS: European Agricultural Knowledge and Innovation Systems (AKIS) towards innovation-driven research in Smart Farming Technology	Smart-AKIS	EU	Spyros Fountas	Greece
87	759	SMALL-SCALE ANAEROBIC DIGESTION FOR AFFORDABLE, EFFICIENT AND SUSTAINABLE MANAGEMENT OF FARMS WASTE	GASFARM	EU	SERECO BIOTEST SNC DI LUCA POLETTI	Italy
88	762	Innovative biogas upgrading system based on novel Zeolite adsorbent technology for producing Bio-based Natural Gas	ZeoBio-NG	EU	NEOZEO AB	Sweden
89	763	Poultry manure valorization	Poul-AR	EU	COLSEN, ADVIESBURO VOOR MILIEUTECHNIEK BV	Netherlands
90	767	Sustainable strategies for the improvement of seriously degraded agricultural areas: The example of Pistachia vera L.	AgroStrat	EU	Hellenic Agricultural Organisation Demeter - Soil Science Institute of Athens	Greece

91	774	Innovative Smart Farming services supporting Circular Economy in Agriculture	LIFE GAIA Sense	EU	NEUROPUBLIC AE PLIROFORIKIS & EPIKOINONION	Greece
92	780	BIOGASTIGER® system – turning global organic waste streams into smart and clean energy	BIOGASTIGER	EU	FWE GmbH	Germany
93	782	Biogas production from non-food lignocellulosic biomass waste	BioFuel Fab	EU	FINRENES OY	Finland
94	784	Innovative and scalable biotechnology using Microbial Fuel Cell and Anaerobic Digestion for the treatment of micro-scale industrial and agriculture effluents to recover energy from waste	H2AD-aFDPI	EU	LINDHURST ENGINEERING LIMITED	United Kingdom
95	785	A cost-effective process for methanisation of unexploited agricultural waste.	DualMetha	EU	DUAL METHA	France
96	790	Economically efficient biogas production from manure fibres and straw	BIOMAN	EU	TEKNOLOGISK INSTITUT, Caroline Kragelund Rickers	Denmark
97	825	Livestock exploitation in Galicia	Livestock exploitation in Galicia	Self funded	Enair	Spain
98	842	CARBON-FARM 2: Sustainable plant production systems	Carbon Farm 2	National	Anton Rasmussen	Denmark
99	858	SAGRI – “Skills Alliance for Sustainable Agriculture"	SAGRI	EU	Agricultural University of Athens	Greece
100	859	Erasmus Project PLANET Plan for Agriculture reNewable Energy Training	PLANET	EU	Dept. DISAFA - University of Turin	Italy
101	860	FIELDS – ANALYSIS OF SKILLS GAPS AND STRATEGIES FOR BIOECONOMY, DIGITALISATION AND SUSTAINABILITY	FIELDS	EU	Università degli Studi di Torino – Scienze agrarie, forestali, alimentari	Italy
102	1004	A continuous milk disinfection system for calf feeding on-farm	MilkGuard	EU	CALVEX A/S	Denmark
103	1010	ENergy efficient Far InfraRed process of manure valorisation	ENFIR	EU	INFRARROJOS PARA EL CONFORT SOCIEDAD ANONIMA	Spain

104	1011	Conversion of manure to energy with the VALI solution	VALI	EU	ATANOR	France
105	1013	Energy efficient and environmentally friendly multi-fuel power system with CHP capability, for stand-alone applications.	PROMETHEUS-5	EU	ELVIO ANONYMI ETAIREIA SYSTIMATON PARAGOGIS YDROGONOU KAI ENERGEIAS	Greece
106	1014	Energy efficient greenhouse dehumidifier for warm climate operating at wide temperature ranges (4-40° C) and free of fluorinated gases	Drygair20	EU	DRYGAIR ENERGIES LTD	Israel
107	1021	integrated Smart GRID Cross-Functional Solutions for Optimized Synergetic Energy Distribution, Utilization Storage Technologies	inteGRIDy	EU	ATOS SPAIN SA	Spain
108	1028	Enabling the drying process to save energy and water, realising process efficiency in the dairy chain	ENTHALPY	EU	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO	Netherlands
109	1029	Integrated engineering approach validating reduced water and energy consumption in milk processing for wider food supply chain replication	ENREMILK	EU	FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV	Germany
110	1042	Supporting Sustainable Energy Production from Biomass from Landscape Conservation and Maintenance Work	greenGain	EU	FACHAGENTUR NACHWACHSENDE ROHSTOFFE EV	Germany
111	1044	Saving COOPerative Energy	SCOoPE	EU	COOPERATIVAS AGRO-ALIMENTARIAS DE ESPANA U DE COOP SOCIEDAD COOPERATIVA	Spain
112	1045	Developing commercial mushroom and vegetable production in an integrated food to waste to food biosystem.	VegWaMus CirCrop	EU	Lindum AS	Norway
113	1049	Renewable residential heating with fast pyrolysis bio-oil	Residue2Heat	EU	RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN	Germany

114	1050	IoT PTO Generators for Emergency Power Supply	Schneeberger	EU	SCHNEEBERGER GENERATOREN GMBH	Austria
115	1051	Optimum, sustainable solution for seed drying and conservation	DryCoolerSeeds	EU	MARCOLD GROUP	Italy
116	1053	Role of technologies in an energy efficient economy – model-based analysis of policy measures and transformation pathways to a sustainable energy system	REEEM	EU	KUNGLIGA TEKNISKA HOEGSKOLAN	Sweden
117	1054	Heating And Cooling Know-how and Solutions	HACKS	EU	AGENCE DE L'ENVIRONNEMENT ET DE LAMAITRISE DE L'ENERGIE	France
118	1055	Design of an agricultural greenhouse for intensive growing of microalgae in fresh / sea water with a syngas production plant and organic farming of chickens and pigs outdoors.	ECO-LOGIC GREEN FARM	EU	SOCIETA' AGRICOLA SERENISSIMA S.S.	Italy
119	1057	Market Uptake of Sustainable and Competitive Carbons for Energy Storage	CareSTOR	EU	ENVIROHEMP SL	Spain
120	1058	Efficient Carbon, Nitrogen and Phosphorus cycling in the European Agri-food System and related up- and down-stream processes to mitigate emissions	Circular Agronomics	EU	INSTITUT DE RECERCA I TECNOLOGIA AGROALIMENTARIES	Spain
121	1103	Healthy crop, Healthy environment, Healthy finances ... through Optimization	H3O	EU	PULVERIZADORES FEDE S.L.U.	Spain
122	1108	Demonstration of a cloud-based precision farming management system for a sustainable and intensive agriculture to secure long-term food supply in Europe - Phase II	AgriCloud P2	EU	AGRI CON GMBH PRECISION FARMING COMPANY	Germany
123	1110	Development of a mobile device for the quick on-site measurement of soil nutrients	MobiLab	EU	PESSL INSTRUMENTS GMBH	Austria
124	1113	Transition towards a more carbon and nutrient efficient agriculture in Europe	Nutri2Cycle	EU	UNIVERSITEIT GENT	Belgium

125	1114	Eco-innovative housing solution for efficient production of slaughterpigs with limited environmental impact	HybridFarm	EU	AGRIFARM INNOVATION APS	Denmark
126	1181	Biomass to Biochar for Farm Bioeconomy	BBFB	EU	Bernard Carey	Ireland
127	1206	Condensed Heat - Optimization and scaling up of an energy efficient, long-during biomass condensation boiler with curved heat exchanger	C-HEAT	EU	BIOCURVE	Spain
128	1212	Identifying Marginal Lands in Europe and strengthening their contribution potentialities in a CO2 sequestration strategy	MAIL	EU	ARISTOTELIO PANEPISTIMIO THESSALONIKIS	Greece
129	1221	Soil Care for profitable and sustainable crop production in Europe	SOILCARE	EU	STICHTING WAGENINGEN RESEARCH	Netherlands
130	1254	INNOVATIVE COMBINATION OF WWT TECHNOLOGIES FOR WATER REUSE: ANAEROBIC-AEROBIC, MICROALGAE AND AOP PROCESSES	LIFE AMIA	EU	SOCIEDAD DE FOMENTO AGRICOLA CASTELLONENSE, S.A.	Spain
131	1255	Synergic TPAD and O3 process in WWTPs for Resoruce Efficient waste management	LIFE STO3RE	EU	SOCIEDAD DE FOMENTO AGRCOLA CASTELLONENSE, S.A.	Spain
132	1276	Efficiency in the use of resources for the improvement of sustainability of vine and wine sector at Priorat region	LIFE PRIORAT+MONTSANT	EU	Fundaci Parc Tecnolgic del Vi	Spain
133	1280	DUCKWEED TECHNOLOGY FOR IMPROVING NUTRIENT MANAGEMENT AND RESOURCE EFFICIENCY IN PIG PRODUCTION SYSTEMS	LIFE LEMNA	EU	Asociacin de Investigacin de la Industria Agroalimentaria (AINIA)	Spain
134	1282	Demonstrative mOdel of circular economy Process in a high quality dairy industry	LIFE DOP	EU	Consorzio Latterie Virgilio	Italy
135	1283	PROFITABLE SMALL SCALE RENEWABLE ENERGY SYSTEMS IN AGRIFOOD INDUSTRY AND RURAL AREAS: DEMONSTRATION IN THE WINE SECTOR.	LIFE+ REWIND	EU	Universidad de Zaragoza	Spain
136	1289	Vineyards for carbon footprint reduction: a sustainable strategy to use biomass for heat & cold in wineries.	LIFE VINEYARDS4HEAT	EU	Ajuntament de Vilafranca del Penedès	Spain

137	1290	LIFE Farm, Fresh Fruit	LIFE - F3	EU	Pulverizadores Fede S.L.U.	Spain
138	1291	Best agricultural practices for Climate Change: Integrating strategies for mitigation and adaptation	Life+ ClimAgri	EU	Asociacin Espaola Agricultura de Conservacin. Suelos Vivos	Spain
139	1292	Farms for the future: Innovation for sustainable manure management from farm to soil	LIFE+Farms for the future	EU	Departamento de Agricultura, Ramaderia, Pesca, Alimentació i Medi Natural de la Generalitat de Catalunya	Spain
140	1302	Feeding strategies to decrease methane emissions and carbon footprint of dairy cows in Belgium, Luxembourg and Denmark	LIFE-Dairyclim	EU	Universit de Lige	Belgium
141	1303	Precision Agriculture System to limit the impact on the environment, on health and on air quality of grape production.	LIFE WINEgROVER	EU	Universit degli Studi della Tuscia	Italy
142	1306	Valorization of pig carcasses through their transformation into biofuels and organic fertilizers	LIFE+ VALPORC	EU	Asociacin de Defensa Sanitaria N 2 Comarcal Porcino	Spain
143	1307	Adaptation to Climate Change of Extensive Livestock Production Models in Europe	LIFE LiveAdapt	EU	Universidad de Córdoba	Spain
144	1479	Sustainable techno-economic solutions for the agricultural value chain (AgroCycle)	AgroCycle	EU	UNIVERSITY COLLEGE DUBLIN, NATIONAL UNIVERSITY OF IRELAND, DUBLIN	Ireland
145	1480	CarbON Valorisation in Energy-efficient Green fuels	CONVERGE	EU	POLITECNICO DI MILANO	Italy
146	1500	Agro Res	AgroRes	EU	Spain	Spain
147	1508	Farm Zero C	FarmZeroC	National	Biorbic/Carberry	Ireland
148	1511	Sustainable Viticulture for Climate Change Adaptation	LIFE VineAdapt	EU	Landgesellschaft Sachsen-Anhalt mbH	Germany
149	1513	Livestock farming against climate change problems posed by soil degradation in the Emilian Apennines	LIFE agriCOlture	EU	Consorzio di Bonifica dell'Emilia Centrale	Italy
150	1521	OLIVE4CLIMATE - LIFE. CLIMATE CHANGE MITIGATION THROUGH A SUSTAINABLE SUPPLY CHAIN FOR THE OLIVE OIL SECTOR	OLIVE4CLIMATE - LIFE	EU	Universit degli Studi di Perugia	Italy

151	1537	BioWILL - An Integrated Zero Waste Biorefinery	BIOWILL	EU	University of Limerick	Europe
152	1565	Development and implementation of a result-based funding mechanism for carbon farming in EU mixed crop livestock systems	LIFE_FERTILIFE	EU	SISTEMAS AVANZADOS ENERGTICOS	Spain
153	1566	INTEGRAL USE OF OIL SEEDS TO REDUCE GREEN HOUSE GASES EMISSIONS ASSOCIATED WITH FARMING ACTIVITIES	LIFE SEED CAPITAL	EU	NEIKER-INSTITUTO VASCO DE INVESTIGACION Y DESARROLLO AGRARIO	Spain
154	1567	CO2 emissions reduction by industrial integration and value chains creation	LIFE-CO2-INT-BIO	EU	FUNDACION PATRIMONIO NATURAL DE CASTILLA Y LEON	Spain
155	1568	Demonstration actions to mitigate the carbon footprint of beef production in France, Ireland, Italy and Spain	LIFE BEEF CARBON	EU	Institut de l'Elevage	France
156	1615	EGIS- ENERGY VILLAGE	eGIS	Self funded	EGIS Verwaltungs GmbH	Germany
157	1619	Cow Energy	Cow Energy	EU	Prof. Dr. Jörn Stumpenhausen	Germany
158	1718	TARK LAUT - an innovative thermo-regulated barn concept solution running on renewable energy.	TARK LAUT	EU	Koivakonnu OÜ	Estonia
159	1720	Wood Chipping Machine for mountain territories in Emilia Romagna (CLEAN-ER)	CLEAN-ER	EU	CIDEA	Italy
160	1721	Fertigation with pig manure digestate	LIFE Smart Fertirrigation	EU	COPISO SORIA	Europe
161	1830	Residual biomass for energy, agronomy and breeding use	RBR-EAS	EU	CRPV Centro Ricerche Produzioni Vegetali	Italy
162	1832	Cavitation of grape pomace for enhancement for energy purposes	CaVin	EU	Centro Ricerche Produzione Animali – CRPA SpA	Italy
163	1835	Smartgas: farming with biogas to reduce carbon footprint and increase sustainability and resilience to climate change of cropping systems for quality	SmartGas	EU	CONFAGRICOLTURA TOSCANA	Italy
164	1836	GOTECFOR - Technology for the mobilization and use of forest biomass in agro-industry	GOTECFOR	EU	FORESTIS - ASSOCIAÇÃO FLORESTAL DE PORTUGAL	Portugal
165	1839	Research project Power2Ammonia Goeree Overflakkee	Power2Ammonia	EU	Tonnie van Peperstraten / A.P.C. van Peperstraten V.O.F.	Netherlands

166	1851	AGIR: Evaluation of the efficiency of the water and energy in hydro-agricultural schemes	AGIR	EU	FENAREG - FEDERAÇÃO NACIONAL DE REGANTES DE PORTUGAL	Portugal
167	1853	Scottish Monitor Farms Programme	Monitor Farm Hub	EU	Quality Meat Scotland	United Kingdom
168	1890	Livestock effluents: strategic approach to the agronomic / energy valorization of the flows generated in agricultural activity	GOEfluentes	EU	INSTITUTO NACIONAL DE INVESTIGAÇÃO AGRÁRIA E VETERINÁRIA IP	Portugal
169	1891	Small Biogas Demonstration Programme (SBDP)	SBDP	EU	IrBEA Ltd	Ireland
170	1892	Use of recycled matrixes as fertilizer for vegetable organic crops. An approach to the improvement of circular economy of the territory.	BIOFERTIMAT	EU	COOPERATIVA AGRICOLA LA PRIMAVERA SCARL	Italy
171	1893	Biomass to Biochar for Farm Bioeconomy (BBFB)	BBFB	EU	Bernard Carey	Ireland
172	1894	Efficacy of vineyard ecosystem as Carbon sink: the case study of the Piacenza area	VinCapTer	EU	Università Cattolica del Sacro Cuore	Italy
173	1929	Policy instruments for energy self-consumption in buildings	ENERSELVES	EU	Extremadura Energy Agency	Spain
174	1932	Integrating RENewable energy and Ecosystem Services in environmental and energy policies	IRENES	EU	IUAV University of Venice	Italy
175	1933	Transfarm 4.0	Transfarm 4.0	EU	CREA-Council for Agricultural Research and Economics	Italy
176	1934	Creating value from waste nutrients by integrating algal and anaerobic digestion technology	ALG-AD	EU	Swansea University	United Kingdom
177	1936	Towards farms with zero carbon-, waste- and water-footprint. Roadmap for sustainable management strategies for Balkan agricultural sector	BalkanROAD	National	BENAKI PHYTOPATHOLOGICAL INSTITUTE (BPI)	Greece
178	1937	Reducing nitrogen loss from livestock production by promoting the use of slurry acidification techniques in the Baltic Sea Region	Baltic Slurry Acidification	EU	JTI - Swedish Institute of Agricultural and Environmental Engineering	Sweden
179	1938	Green biorefineries for sustainable production of bioenergy from agriculture	Green VALLeys	EU	Agroväst Livsmedel AB	Sweden
180	1939	Environmentally-friendly Management of Organic Fertilizers in Agriculture	GreenAGRI	EU	Eesti Põllumajandus-Kaubanduskoda	Estonia