Final report on dissemination and exploitation of REFRESH results

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Acknowledgments & Disclaimer

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List of abbreviations

Anthesis	Anthesis (UK) Limited
BOKU	University of Natural Resources and Life Sciences, Vienna
CCFA	China Chain Store & Franchise Association
CHEARI	China Home Electronic Appliance Research Institute
CoE	Community of Experts
CREDA	Center for Agro-food Economy and Development
CSCP	Collaborating Centre on Sustainable Consumption and Production
Deloitte	Deloitte Sustainability
DG Sante	Directorate General Health and Food Safety
Ecologic	Ecologic Institute
EU	European Union
EuroFIR	European Food Information Resource AISBL
FAO	Food and Agriculture Organisation of the United Nations
Feedback	Global Feedback Limited
FORKLIFT	Food side flow Recovery LIFe cycle Tool
EU Platform on FLW	EU Platform on Food Losses and Food Waste
GDPR	General Data Protection Regulation
HFA	Hungarian Food Bank Association
IFR	Institute of Food Research
IVL	Swedish Environmental Research Institute
NGO	Non-Governmental organisation
NPO	Non-Profit organisation
UNEP	United Nations Environment Programme

PWP	Pilot Working Platform
QIB	Quadram Institute Bioscience
REFRESH	Resource Efficient Food and dRink for the Entire Supply cHain
SDG	Sustainable Development Goal
UN Environment	United Nations Environmental Programme
VA	Voluntary Agreement
WRAP	Waste and Resources Action Programme
WRI	World Resources Institute
WUR	Wageningen University & Research

1 Executive Summary

The success of the communication and dissemination activities and the public outreach of the REFRESH project significantly outpaced expectations and achievements of comparable EU research projects.

This report provides a detailed overview of REFRESH's activities as well as an assessment of their outreach and impact. It also reflects on the lessons learned of REFRESH's communication activities, including barriers and success formats. Key highlights are summarised below:

- **REFRESH website**: The project's website at eu-refresh.org served as the central mean and backbone of all communication and dissemination activities. Until July 2019, 348 **articles** have been posted. The total amount of website visits in the last three years – once the first REFRESH research results were published – was 282.970. These visits resulted in **511.051 page views**. Of the different information categories results articles have been viewed 20.820 times. **Attachments have been downloaded 8.028 times.** Engagement with the website overall showed an increasing trend.

- **Online network "Community of Experts"**: REFRESH also created itself an online network for knowledge and best practice on food waste prevention: the **REFRESH Community of Experts (CoE)**. The CoE launched on 16 October 2017 at refreshcoe.eu. On the REFRESH CoE, experts can register as users to share their own research results, tools and innovative approaches, as well as interact with the contributions of other experts. The CoE has been **created in partnership with the EU Platform on Food Losses and Food Waste**. The Platform has decided to use the CoE as its main source for new and updated food waste prevention web content. The **Platform plans to take over the CoE after REFRESH has ended to continue REFRESH's work** in community building and knowledge sharing. In July 2019, the CoE counted **437 members.**

- **REFRESH events:** Events were a central communication instrument in the project. Two conferences, a series of policy workshops, national platform meetings, webinars etc. were held. Overall, REFRESH organized 55 events in eight countries (including China). In total, approximately **4.000 participants** attended the REFRESH events. The evaluation of feedback from participants showed that REFRESH workshops and conferences were **valued for their innovative approach, interactive elements and good atmosphere** (facilitating informal networking and interaction through speed dating, excursions and participative group working phases, including art, design, live pigs, disco chop, food waste beer, photo props etc. to communicate results) as well as for their **high quality of research results** that were presented and summarized according to the needs of scientific and practice stakeholders. It also broadened the reach to interested Member States that wanted to test and implement REFRESH results. For example, after the policy workshop on Voluntary Agreements 7 more Member States were seriously considering taking this approach to

address food waste within their country. Until the end of the project, three of them received a workshop or training by the REFRESH team.

- **National platforms and pilot activities:** The work within the national platforms – particularly the **setup of pilot projects achieved significant impacts** as well, e.g. through the training of apprentices at retailer Penny, introduction of a food waste measuring at the Spanish trade fair "Gastrofira", significant food waste reduction at catering events in the tests of the Hungarian guidance "Event Catering Food Waste Reduction Guideline" (that was also translated in English) and the introduction of a surplus food shelf at the Dutch retailer Jumbo, offering products of 17 national surplus social entrepreneurs all made of ingredients that would have otherwise gone to waste.

- **REFRESH publications**: Within four years project duration REFRESH published **75 reports and articles, 4 policy briefs**, **9 academic journal articles** (with **another 12 planned** for publication after the project's end), **42 project reports**, **3 frameworks for action**, **4 decision support systems** (Voluntary agreement Blueprint, Animal Feed Tool FORKLIFT and FoodWasteExplorer), **12 videos** and **3 results brochures** (2 interim and 1 final).

- **REFRESH contests:** A REFRESH "**Food Waste Solution Contest**" was organised at the end of 2016. Individuals, organisations, start-ups and large companies made contest submissions. The REFRESH Food Waste Solution Contest received over **50 project submissions** from across Europe. Besides two jury prizes the contest also included a public prize. The public voting for the best ideas counted over **61.000 votes**. Several **contest participants seized the opportunity of the public award to reach out to their communities and the public** and increase the visibility of their initiatives. The REFRESH Food Waste Solution Contest was a very helpful tool to communicate to the public and broaden the REFRESH network that has later been used to disseminate REFRESH research results. The contest was **replicated in China** and received even more attention.

- **The REFRESH Twitter account** (@Eurefresh) counted **2.165 followers** by 31 July 2019. In terms of community building, it is the most successful REFRESH channel. In the last three years of the project, a total of **763 tweets** has been posted and @Eurefresh has been **mentioned 1.640 times by other Twitter channels**.

- **Facebook**: On facebook.com/eurefresh, the REFRESH page has reached **1001 likes** by 31 July 2019. In the last three years of the project, a total of **629 posts** have been made on Facebook.

- **Videos/YouTube**: Within the project several videos were produced (introduction into the project, call for ideas for the Food Waste Solution Contest, conference video, note of EU Commissioner V. Andriukaitis, webinar videos etc.) and uploaded to YouTube. These videos resulted in **over 5.000 views** (with more than 7.000 minutes watch time) until July 2019, not including four videos with project results that are planned to be published in autumn 2019.

- **Media mentioning**: **90 mentions** of REFRESH in other media (newspapers, newsletters, blogs, websites, radio, TV etc.) have been reported.

- **Direct networking/presentation at external events**: During the whole project, REFRESH partners widely interacted with existing groups and networks. REFRESH and selected REFRESH results were presented to different target groups at numerous conferences and events. REFRESH partners reported to have represented REFRESH at **173 external events** covering a broad geographic range in Europe, North America, and China, and a broad range of stakeholders from business, governments, academia, and civil society. Moreover, the REFRESH project **intensively interacted with the EU Platform on Food Loss and Waste**.

2 Introduction and Background

This report presents an overview and evaluation of the dissemination activities undertaken in the REFRESH project (running July 2015 to June 2019). Its purpose is to summarize the dissemination activities of the REFRESH project and to evaluate their effectiveness and impact in order to provide lessons learned and help build experience and capacity within future European research projects.

REFRESH dissemination activities were planned in a dissemination strategy in 2015. The strategy, its objectives and its role to support communication activities is summarized below (chapter 2.1-2.3).

The following chapters are dedicated to an analysis of the instruments used: Chapter 3 analyses the role of REFRESH events (the two conferences and the incubator day, policy workshops, webinars and REFRESH national platform events), chapter 4 reflects on publications (policy briefs, academic journals, project reports, decision support systems, results brochures), chapter 5 presents the REFRESH contest and quiz, chapter 6 describes the dissemination activities through REFRESH channels such as the website, Community of Experts, newsletter, social media activities on Twitter and Facebook, videos and press releases. Dissemination activities through partner's channels are described in chapter 7. Direct networking at the EU Food Loss and Waste Platform and other external events are the last category, described in chapter 8. In its last parts this reports reflects on (additional) impacts of REFRESH's communication and dissemination activities (chapter 9) and summarizes lessons learned (chapter 10).

2.1 Objectives and target groups for communication activities

The overall goal of REFRESH was to contribute towards Sustainable Development Goal (SDG) 12.3 of halving per capita food waste at the retail and consumer level and reducing food losses along production and supply chains, reducing waste management costs, and maximizing the value from unavoidable food waste.

REFERESH dissemination and communication activities aimed at increasing the impact of the REFRESH outputs to external stakeholders.

In 2015, the project team wrote the first REFRESH dissemination strategy. It introduced the dissemination-related objectives of REFRESH, identified relevant target groups, described the different communication instruments of REFRESH and explained the role of the consortium partners in dissemination. The strategy was revised twice after evaluations of dissemination activities in 2016 and 2017. In order to monitor dissemination activities, each REFRESH partner was asked to provide information every six month within the project duration.

The dissemination related objectives of REFRESH as described in the REFRESH dissemination strategy are:

- **Facilitate knowledge exchange** and ongoing mutual learning between different stakeholders and between different regions.

- **Raise awareness** among food chain stakeholders, policy makers and the wider public on the economic, environmental and social impact of food waste, opportunities for its prevention, and the benefits of reducing food waste.

- **Involve relevant stakeholders in the development and implementation of strategies against food waste** undertaken within REFRESH, and ensure that the findings of the project will be taken up by the relevant stakeholders.

- **Share best practice** across the EU28, third countries (incl. China) and internationally and improve opportunities for implementation.

- **Showcase the impacts and outcomes of the project's research and innovation activities.**

- Maximize the availability, accessibility and awareness of the results and learnings from the project to **maximize its ongoing impact and legacy**.

REFRESH dissemination target groups include representatives from industry, business, retail and trade. Policy-makers and the organized civil society were involved, too. Being a research project REFRESH also wanted to reach out to the scientific community. Although the outputs of REFRESH do not specifically target consumers and the general public, the project recognises the importance of consumers for reaching the project's goals. Accordingly, some dissemination instruments also targeted consumers alongside other target groups in order to leverage the power of consumers for achieving the business, policy, and behavioural changes necessary for food waste reductions. The project also sought to target journalists, bloggers, and other public figures *as multipliers* when appropriate in order to reach stakeholders.

2.2 Communication instruments

The involvement of relevant stakeholders and the targeted provision of salient, appropriately designed information can be seen as the central means by which REFRESH aimed at creating system innovation which reduces food waste,

increases waste valorisation and leads to sustainable diets. The following table gives an overview of the communication instruments established and/or used for REFRESH dissemination activities and points to more detailed information in this report.

Table 1: Overview of REFRESH communication instruments

REFRESH communication instrument	More info in chapter
Events	3
Publications	4
Contests	5.1 and 5.2
Quiz	5.3
Project Websites	6.2 and 6.3
Project Newsletter	6.4
Twitter	6.5
Facebook	6.6
YouTube	6.7
Press Releases / Direct Mailings	6.8
REFRESH partners' channels	7
Direct networking	8
Presentations at external events	8.1

Source: REFRESH 2019

In the beginning year of the project a visual project identity and basic information material (flyer, presentation) were developed. The REFRESH website was launched in September 2015 and social media channels were established. A first press release announcing the project was sent out in October 2015. In the first months of a research project it is always difficult to produce content for the project website because there are not yet project results available. To bridge this gap and to start attracting a community the REFRESH dissemination team first collected and redistributed food waste related contents from other stakeholders, especially in the REFRESH website sections "News" and "Events" as well as on social media. This third party content on REFRESH channels was gradually reduced as the project partners created own content. The first REFRESH Newsletter was sent out in March 2016.

Then a REFRESH Food Waste Solution Contest was organised in 2016/2017. It included a public voting in which over 61,000 votes were cast. Voters also became interested in the REFRESH project and probably in the issue of food waste in general. Visits on the REFRESH website significantly increased during and after the public voting period. The amount of REFRESH followers on Facebook and Twitter increased. Therefore, it can be said that the REFRESH Food Waste Solution Contest was very helpful to communicate to the public and

broaden the REFRESH network that has later been used to disseminate REFRESH research results.

In 2016 REFRESH national pilot working platforms for Voluntary Agreements (Vas) to reduce food waste have been established in Germany, The Netherlands, Hungary, Spain and China. They shared food waste reduction challenges and practices and increasingly reported about their meetings, outputs and pilot activities. Additionally, the voluntary approach was discussed in a policy workshop in 2018 in Amsterdam. Experiences from all national platforms were distilled into a blueprint that provides a step-by-step overview on how Member States can successfully set up and conduct Vas on food waste reduction.

As first REFRESH research results were available direct interaction, knowledge exchange, mutual learning, involvement and networking with stakeholders became increasingly important and intense. Therefore, events became the central communication instrument in the second half of the project. Two conferences and series of policy workshops and webinars were held. Furthermore, REFRESH partners increasingly presented and discussed REFRESH results at external events to liaise with broader networks.

Towards the end of the project, publications became an essential mean of result dissemination. All project reports were made available on the REFRESH website. Publications in scientific journals increased and some more are planned to be published after the project's end. A series of policy briefs was published. Several online decision support tools were launched (e.g. Vas blueprint, FORKLIFT, FoodWasteEXplorer, Animal Feed Tool). A series of videos is produced in 2019 to summarise key results of REFRESH and present them in an attractive format.

It has always been clear that the REFRESH communication channels cannot be maintained after the project's end. They will remain online but no further content will be added. Therefore, REFRESH launched an online community of experts (CoE) at refreshcoe.eu in 2017. All REFRESH results are also available via the CoE. The EU Platform on Food Losses and Food Waste (FLW) has decided to use the CoE as its main source for new and updated food waste prevention web content. The Platform plans to take over the CoE after REFRESH has ended to continue REFRESH's work in community building and knowledge sharing.

2.3 Coordinating and supporting dissemination activities

Ecologic Institute was the leader of Work Package (WP) 7 "Communication, impact oriented dissemination and exploitation", yet all partners shared in the responsibility for dissemination and had a certain amount of time and budget allocated in this WP. WP7 received input from all other WPs.

Ecologic Institute supported the partners in providing input for the REFRESH dissemination channels and in using partners' channels for disseminating REFRESH news. For example, a guiding template for providing web content for eu-refresh.org was provided. Web contents submitted by the partners were reviewed by an editorial team at Ecologic Institute. To make it easy for the partners to use their channels for REFRESH, Ecologic Institute provided

dissemination kits for selected news. These kits included text suggestions for website posts, Facebook and Twitter as well as free images.

A practically oriented presentation on web-writing principles was given at a project meeting in Budapest in September 2018. Another training was provided in January 2019 in Berlin. It dealt with extracting media-friendly key messages from complicated scientific results and provided an opportunity for interview exercises with a professional journalist.

Furthermore, Ecologic Institute regularly presented click statistics of the REFRESH channels in order to encourage the partners to provide content and to use their own institutional and personal channels for disseminating REFRESH contents. The aim was to create a motivating sense of competition, for instance by comparing how many clicks the REFRESH national platforms received or which partner was most successful in referring users to the REFRESH website.

3   REFRESH Events

Within four years project duration REFRESH organised 55 events in eigth countries. In total, over 4000 participants attended events organized by REFRESH and events that were kick-started through REFRESH. The following table gives an overview of all REFRESH events in chronological order. More information about each event can be found in the chapter of this report that is indicated in the table. In cases where no specific numbers of participants were available numbers of participants are marked with a symbol (~).

Table 2: Overview of REFRESH events in chronological order

REFRESH Event Title	Type	Date	Location	Number of Participants	More info in chapter	Organisation
1st German REFRESH Pilot Working Platform meeting	PWP Event Germany	2 Feb 2016	Wuppertal	15	3.6.1	CSCP
1st Meeting of Spanish REFRESH Platform	PWP Event Spain	2 Mar 2016	Barcelona	17	3.6.4	CREDA
Hungarian Steering Committee Launch	PWP Event Hungary	22 Mar 2016	Budapest	14	3.6.2	HFA
2nd Meeting of the German Business Engagement Steering Committee	PWP Event Germany	1 May 2016	Wuppertal	9	3.6.1	CSCP
2nd Meeting of the Spanish REFRESH Platform	PWP Event Spain	22 Sep 2016	Barcelona	20	3.6.4	CREDA
3rd Meeting of German Pilot Working Platform Germany	PWP Event Germany	6 Oct 2016	Wuppertal	17	3.6.1	CSCP
Launch meeting of the Dutch Pilot Working Platform Netherlands: Taskforce Circular Economy in Food	PWP Event Netherlands	26 January 2017	The Hague	100	3.6.3	Deloitte
Food waste reduction training of PENNY apprentices successfully completed	PWP Event Germany	2017-2018	Germany	~850	3.6.1	CSCP
2nd Meeting of the Dutch Pilot Working Platfrom	PWP Event Netherlands	9 March 2017	Veghel	25	3.6.3	Deloitte

4th Meeting of German Pilot Working Platform Germany	PWP Event Germany	6 Apr 2017	Wuppertal	19	3.6.1	CSCP
Food Waste 2017 Multi-stakeholder Conference	Conference	18 May 2017	Berlin	150	3.1	Ecologic Institute
Incubator Day	Workshop	19 May 2017	Berlin	40	3.2	Ecologic Institute
3rd Meeting of the Dutch Pilot Working Platform	PWP Event Netherlands	7 June 2017	Veghel	25	3.6.3	Deloitte
4th Meeting of the Dutch Pilot Working Platform	PWP Event Netherlands	19 Sep 2017	Veghel	30	3.6.3	Deloitte
Hungarian Pilot Working Platform Meeting	PWP Event Hungary	20 Sep 2017	Budapest	60	3.6.2	HFA
5th German REFRESH Steering Committee Meeting	PWP Event Germany	11 Oct 2017	Wuppertal	13	3.6.1	CSCP
Sowing the seeds for short and long term improved EU policies for food waste	Policy Workshop	8 Nov 2017	Brussels	45	3.4.1	Ecologic Institute
5th Meeting of the Dutch Pilot Working Platform	PWP Event Hungary	14 Nov 2017	The Hague	40	3.6.3	Deloitte
Expert seminar on the viability of feeding treated surplus food to pigs and chickens	Policy Workshop	22 Nov 2017	Wageningen	13	3.4.2	Feedback
3rd Meeting of the Spanish REFRESH Platform	PWP Event Spain	23 Nov 2017	Barcelona	22	3.6.4	CREDA
EU commissioner Andriukaitis and minister Schouten visit Dutch Taskforce on Circular Economy	PWP Event Netherlands	28 Nov 2017	Veghel	~50	3.6.3	WUR
Sino-Nordic Seminar on Sustainable	Seminar	13-14 Jan	Shanghai	40	3.6.5	IVL

Food Systems and Food Waste		2018				
Hungarian National Steering Committee Meeting	PWP Event Hungary	12 Feb 2018	Budapest	17	3.6.2	HFA
Dutch Champions 12.3 Event: Appetite for Action	Event	20 Mar 2018	Veghel	~40	3.6.3	WUR
Seminar on "organizing China food waste reduction alliance"	Seminar	23 Mar 2018	Beijing	100	3.6.5	IVL
6th German REFRESH Steering Committee Meeting	PWP Event Germany	11 Apr 2018	Wuppertal	18	3.6.1	CSCP
Launch of Food Waste Reduction China Action Platform China	Launch Event	8 Jun 2018	China	~100	3.6.5	IVL
6th Meeting of the Dutch Pilot Working Platform	PWP Event Netherlands	12 Jun 2018	Veghel	40	3.6.3	Deloitte
REFRESH Policy Working Group on Voluntary Agreements	Policy Workshop	19 Jun 2018	Amsterdam	33	3.4.3	Deloitte
Hungarian Food Bank at the Night of the Market	Event	22 Jun 2018	Budapest	~100	3.6.2	HFA
Nordic Environmental Youth Summer Camp	Camp	4-16 Aug 2018	China, Sweden, Finland	20	3.6.5	IVL
7th Meeting of the Dutch Pilot Working Platform	PWP Event Netherlands	29 Aug 2018	Veghel	40	3.6.3	Deloitte
EU-Platform on FLFW – subgroup Action & Implementation meeting	EU Event/ PWP Event Netherlands	1 Oct 2018	Veghel	40	3.6.3	Deloitte
Feeding treated surplus food to pigs	Policy Workshop	30 Oct 2018	Brussels	~100	3.4.4	Feedback

7th German REFRESH Steering Committee Meeting	PWP Event Germany	8 Nov 2018	Wuppertal	17	3.6.1	CSCP
Policies against consumer food waste	Policy Workshop	19 Nov 2018	Berlin	40	3.4.5	Ecologic Institute
8th Meeting of the Dutch Pilot Working Platform	PWP Event Netherlands	3 Dec 2018	Veghel	35	3.6.3	Deloitte
4th Meeting of the Spanish REFRESH Platform	PWP Event Spain	11 Dec 2018	Barcelona	18	3.6.4	CREDA
Launch United against Food Waste	PWP Event Netherlands	27 Dec 2018	Veghel	40	3.6.3	Deloitte
Food loss and waste reduction and management course	Training/ Seminar	21-25 Jan 2019	Zaragoza	~30	3.6.4	CREDA
United Against Food Waste Champions 12.3 event	Event/ PWP Event Netherlands	12 Mar 2019	Veghel	75	3.6.3	Deloitte
Launch event of Voluntary Action Plan and Food Waste Reduction: Initiative Proposed by CCFA Chain Catering Enterprises	Event	13 Mar 2019	Shanghai	1400	3.6.5	IVL
Integrated Policies for Food Waste and Sustainable Food Systems in the Circular Economy	Policy Workshop	22 Mar 2019	Brussels	40	3.4.6	WUR, Ecologic Institute, Deloitte
8th German REFRESH Steering Committee Meeting	PWP Event Germany	8 Apr 2019	Wuppertal	17	3.6.1	CSCP
Adding value to food waste and by-products	Webinar	9 Apr 2019	online	131	3.5.1	Anthesis, WRAP

Voluntary Agreements to address food waste	Webinar	10 Apr 2019	online	99	3.5.2	Anthesis, WRAP
Tackling consumer food waste	Webinar	29 Apr 2019	online	110	3.5.3	Anthesis, WRAP
Measuring and managing retail food waste	Webinar	2 May 2019	online	94	3.5.4	Anthesis, WRAP
5th Meeting of the Spanish REFRESH Platform	PWP Event Spain	9 May 2019	Barcelona	21	3.6.4	CREDA
Guided Bicycle Tour and Tasting of Local Organic Produce in the Agricultural Park of Gallecs	Side event	9 May 2019	Barcelona	19	3.3.1	Ecologic Institute
Guided Walking Tour on Food Waste Reduction at "Mercabarna"	Side event	9 May 2019	Barcelona	23	3.3.2	Ecologic Institute
Zero Waste Mission – A Hands-on Workshop on how to make Bioplastics from Food Waste	Side event	9 May 2019	Barcelona	17	3.3.3	Ecologic Institute
Food-for-Thought: an Interactive Dialogue over Dinner about Food Sustainability in the City	Side event	9 May 2019	Barcelona	24	3.3.4	Ecologic Institute
REFRESH final conference: Fresh ideas to reduce food waste and valorise surplus food	Conference	10 May 2019	Barcelona	150	3.3	Ecologic Institute
Final meeting of the Dutch Pilot Working Platform – take over within United against Food Waste	PWP Event Netherlands	June 2019	Veghel	45	3.6.3	Deloitte

Source: REFRESH 2019

3.1 Food Waste 2017 Multi-stakeholder Conference

18 May 2017 - Berlin

The REFRESH Food Waste 2017 Multi-stakeholder Conference brought together 150 leaders in food waste prevention, reduction and valorisation. REFRESH **partners presented first results** and ongoing work of the REFRESH project with several high level panels and a debate. The **winners of the REFRESH Food Waste Solution Contest presented** their projects and several interactive networking sessions brought practitioners together with policy makers and entrepreneurs. Throughout the day, conference participants could tour an **Innovator Fair** which invited and showcased successful food waste initiatives from across Europe.

The Conference featured **several innovative elements** including **two food waste art installations** and a performative interpretation of the day's events by an **improvisational theatre group**. Two **real-live pigs** joined the Conference in the afternoon to bring attention to the controversial issue of using surplus food to feed livestock. Following the Conference, participants were encouraged to take part in a "**Disco Chop**" evening event. Participants helped prepare the evening meal chopping rescued fruit and vegetables. The first German **craft beer brewed from surplus bread** was made especially for the REFRESH Conference by the Berlin Brewery Straßenbräu.

Documentation (including video and pictures) is available at: http://eu-refresh.org/conference2017

3.2 Incubator Day

19 May 2017 - Berlin

Food waste stakeholders met for an interactive Food Waste Innovation Incubator Day. The Incubator Day took place one day after the REFRESH 1st conference and was co-hosted with the German Federal Ministry of Food and Agriculture (BMEL) and their initiative "Too good for the bin!". The event was carried out in collaboration with the Food Surplus Entrepreneurs Network. The aim of this workshop was to bring food waste innovators (including the winners of the REFRESH contest) and experts together to learn from each other, develop solutions to food waste issues in the food chain, and improve cooperation. The main target groups were entrepreneurs, companies in the food industry, and policy makers. The workshop received overwhelming positive feedback from participants, including feedback that the activities and results will help them improve their work on food waste.

Documentation is available here: http://eu-refresh.org/food-waste-innovation-incubator-day

3.3 REFRESH final conference

10 May 2019 – Barcelona

The final conference brought together 150 participants from all across Europe, China, Australia and the US to present and discuss innovative ideas for food waste reduction and valorisation options across the whole supply chain. Its key target was to summarize the main REFRESH results and reflect them with stakeholders from policy, research and practice. With a **disco chop** in the evening, a "**doggy bag design contest**" and **art installations** it used innovative formats for networking and the discussion of the final project results. Preceding the conference, on 9 May, 2019, participants went to **field trips** (see chapters 3.3.1 – 3.3.4 below) in and around Barcelona to see sustainable food production, food waste prevention and reuse and valorisation of food waste in action.

Documentation is available at: https://eu-refresh.org/conference2019

3.3.1 Guided Bicycle Tour and Tasting of Local Organic Produce in the Agricultural Park of Gallecs

9 May 2019 – Barcelona

The bike trip around the Agricultural Park of Gallecs, brought participants 15 km north of Barcelona. Between lush meadows and fields of this predominantely organically managed land, Gemma Safont I Artal and Albert Garcia Macian from the Consortium of Gallecs explained the history of the Park, its relevance for the local community in terms of sustainable food supply and recreational activities. The guided tour led to local producers and the agricultural cooperative. The tour ended with a picnic-style food tasting of local produce.

Documentation is available at: https://eu-refresh.org/guided-bicycle-tour-and-tasting-local-organic-produce-agricultural-park-gallecs

3.3.2 Guided Walking Tour on Food Waste Reduction at "Mercabarna"

9 May 2019 – Barcelona

At the guided walking tour around the Mediterranean's Biggest Food Hub 'Mercabarna', participants learned about food waste reduction in a Food Hub that guarantees the supply of fresh food to over 10 million consumers. The tour led to the Central Fruit and Vegetable Market, the Food Bank warehouse which serves as a collection and distribution centre for the excess fresh food donated by the companies, and the "Green Point" where Mercabarna's waste is collected and separated.

Documentation is available at: https://eu-refresh.org/guided-walking-tour-food-waste-reduction-%E2%80%9Cmercabarna%E2%80%9D

3.3.3   Zero Waste Mission – A Hands-on Workshop on how to make Bioplastics from Food Waste

9 May 2019 – Barcelona

At PLAT Institute of Augmented Gastronomy, food valorisation options were taught in a 3-hour hands-on upcycling workshop, that included the creation of bioplastics out of food waste. First, the hosts Ignacio de Juan-Creix and Irene Ródenas from PLAT gave theoretical input on the bioplastic research conducted at the institute. In the practical session participants had the chance to explore different techniques, compositions and recipes to develop own prototypes in small group settings and finally make our own sustainable bioplastics.

Documentation is available at: https://eu-refresh.org/zero-waste-mission-%E2%80%93-hands-workshop-how-make-bioplastics-food-waste

3.3.4   Food-for-Thought: an Interactive Dialogue over Dinner about Food Sustainability in the City

9 May 2019 – Barcelona

In the open and interactive dialogue over dinner 'Food-for-Thought', hosted by Mayya Papaya from Foodisms, participants discussed about sustainable food and its meaning in the urban context, while enjoying a 3-course-meal from seasonal and sustainably sourced ingredients.

Documentation is available at: https://eu-refresh.org/food-thought-interactive-dialogue-over-dinner-about-food-sustainability-city

3.4   Policy workshops

Since 2017 REFRESH started to discuss its project results with relevant policy-makers in a series of policy workshops. Workshops discussions contributed to the content of the REFRESH policy briefs (see chapter 4.1).

3.4.1   Sowing the seeds for short and long term improved EU policies for food waste: REFRESH Policy Workshop

8 November 2017 - Brussels

This workshop presented and discussed preliminary findings on opportunities for improving EU policies relevant to food waste prevention and valorisation and explored short- and long-term strategies with stakeholders. It was directed at policymakers and high-level experts in food waste from business, research, and civil society.

Documentation is available at: https://eu-refresh.org/sowing-seeds-short-and-long-term-improved-eu-policies-food-waste-refresh-policy-workshop

3.4.2 Expert seminar on the viability of feeding treated surplus food to pigs and chickens

22 November 2017 – Wageningen

An expert seminar examined the viability of feeding treated surplus food to pigs and chickens. It examined the hazards and risk factors, and the environmental benefits. The panel concluded the practice is viable provided certain safety measures are enforced involving a combination of heat treatment and acidification and a system to prevent cross-contamination.

Documentation is available at: https://eu-refresh.org/eu-panel-experts-concludes-feeding-treated-surplus-food-pigs-viable-provided-certain-safety-0

3.4.3 REFRESH Policy Working Group on Voluntary Agreements

19 June 2018 - Amsterdam

The workshop aimed to spotlight VAs as a policy instrument for more sustainable food systems. Member state representatives and policy experts discussed this subject targeting two key questions: Why are VAs key instruments for food waste reduction? And how can they be set up at the national level?

Documentation is available at: https://eu-refresh.org/refresh-policy-working-group-voluntary-agreements

3.4.4 How can Europe benefit from the economic and environmental benefits of feeding pigs treated surplus food while regulating this practice to prevent disease?

30 October 2018 – Brussels

To answer the question "How can Europe benefit from the economic and environmental benefits of feeding pigs treated surplus food while regulating this practice to prevent disease?" one of Japan's top ecofeed experts joined European experts in a panel discussion to weigh the economic, environmental and safety risks of:

a) continuing under the current ban on feeding surplus food that contains meat to omnivorous livestock, or

b) adopting legislation that permits the production of pig feed from heat-treated food surplus produced in specialist licensed plants, inspired by the Japanese ecofeed industry.

Documentation is available at: https://eu-refresh.org/policy-panel-how-can-europe-benefit-economic-and-environmental-benefits-feeding-pigs-treated-surplus

3.4.5 Policies against consumer food waste: REFRESH Policy Workshop Public campaigns and other policy options for behaviour change

19 November 2018 – Berlin

Public campaigns and other policy instruments can significantly influence consumer behavior and contribute to a reduction of consumer food waste. There are only very few studies that have evaluated to what extent policy interventions actually reduced or prevented food waste. The REFRESH Policy Workshop "Public campaigns and other policy options for behaviour change" discussed the findings of REFRESH work on consumer behaviour and policy recommendations.

Documentation is available at: https://eu-refresh.org/policies-against-consumer-food-waste-refresh-policy-workshop-public-campaigns-and-other-policy

3.4.6 Integrated Policies for Food Waste and Sustainable Food Systems in the Circular Economy

22 March 2019 - Brussels

The final REFRESH workshop discussed options and recommendations to integrate policies for food waste in the broader contexts of sustainable food systems and the Circular Economy. Building on the results created within the REFRESH project, the workshop brought together policy makers and experts from research, NGOs and businesses to discuss EU policy options that go beyond efforts to reduce food waste and includes other sustainability aspects such as health and social impacts.

Documentation is available at: https://eu-refresh.org/integrated-policies-food-waste-and-sustainable-food-systems-circular-economy

3.5 Webinars

In April-May 2019, the REFRESH Community of Experts (CoE) hosted a webinar series on 'Tackling Food Waste Across the Supply Chain'. The webinars were organised by Anthesis with oversight and input from WRAP. Recordings of each webinar are available on the CoE (alongside a PDF copy of the presentation slides), REFRESH website and REFRESH YouTube channel.

The series aimed to demonstrate how policy makers, manufacturers, retailers, distributors, municipalities and many more organisations involved in the food supply chain can effectively address food waste. The intended objectives of the webinar series were to:

1. Disseminate information regarding food waste and increase awareness of the tools and information available from REFRESH.
2. Increase awareness and use of the CoE website.
3. Provide an opportunity for interested parties to gain practical information and engage directly with expert speakers.

Key publicity routes for the webinars were:

- A dedicated page on the CoE website and listings in the event calendar (http://www.refreshcoe.eu/refresh-webinar-series/)

- A news article on the primary REFRESH website advertising the series launch (https://eu-refresh.org/refresh-community-experts-launches-food-waste-webinar-series-april-may-2019)

- Multiple tweets and LinkedIn promotions from Anthesis, REFRESH, WRAP and other partners

- Advertisement via Eventbrite

- Emails to key REFRESH contacts (including Work Package leads) before and after the webinars to encourage them to disseminate information about the webinars and recordings

- Designed mailshot from Anthesis to relevant contacts in Europe, Canada and the US

- Promotions such as mailshots, newsletter information and website advertisements from REFRESH delivery partners and speakers.

The statistics for the webinars are given in the following table. The number of views for recordings are as of 31 July 2019. The number of questions and comments relate to those asked during the live session.

Table 3: Statistics for REFRESH webinars

REFRESH Webinar Title	Date	Registrations	Participants	Questions / Comments	Recording views	Total views
Adding value to food waste and by-products	9 Apr 2019	124	63	10	68	131
Voluntary Agreements to address food waste	10 Apr 2019	79	39	9	60	99
Tackling consumer food waste	29 Apr 2019	124	61	11	49	110
Measuring and managing retail food waste	2 May 2019	117	42	6	52	94

Source: REFRESH 2019

3.5.1 Adding value to food waste and by-products

9 April 2019 - online

This REFRESH webinar provided insights into opportunities and approaches for increasing the value of food waste and by-products.

Documentation is available at: https://eu-refresh.org/webinar-adding-value-food-waste-and-products

3.5.2 Voluntary Agreements to address food waste

10 April 2019 - online

This REFRESH webinar provided insights into a collaborative approach to reduce food waste along the whole supply chain.

Documentation is available at: https://eu-refresh.org/webinar-voluntary-agreements-address-food-waste

3.5.3 Tackling consumer food waste

29 April 2019 - online

This REFRESH webinar provided insights into drivers and interventions to tackle food waste at home.

Documentation is available at: https://eu-refresh.org/webinar-tackling-consumer-food-waste

3.5.4 Measuring and managing retail food waste

2 May 2019 - online

This REFRESH webinar provided insights into identifying, measuring and collaborating to address food waste in the retail sector.

Documentation is available at: https://eu-refresh.org/webinar-measuring-and-managing-retail-food-waste

3.6 REFRESH national platform events

REFRESH partners reported that they hosted numerous Pilot Working Platform (PWP) meetings. Furthermore, a number of other events have been organised by the PWP, for instance in the context of pilot projects.

3.6.1 Germany

Meetings of the German Pilot Working Platform

2 February 2016 – Wuppertal: 1st German REFRESH Pilot Working Platform meeting (https://eu-refresh.org/pilot-working-platform-germany-takes-shape)

1 May 2016 – Wuppertal: 2nd Meeting of the German Business Engagement Steering Committee (https://eu-refresh.org/2nd-german-steering-committee-meeting-finalises-framework-action)

6 October 2016 – Wuppertal: 3rd Meeting of German Pilot Working Platform Germany (https://eu-refresh.org/pwp-germany-decides-potential-priority-areas-upcoming-projects)

6 April 2017 – Wuppertal: 4th Meeting of German Pilot Working Platform Germany (https://eu-refresh.org/pwp-germany-well-track)

11 October 2017 – Wuppertal: 5th German REFRESH Steering Committee Meeting (https://eu-refresh.org/members-pilot-working-platform-germany-actively-working-pilots-and-data-baselining)

11 April 2018 – Wuppertal: 6th German REFRESH Steering Committee Meeting (https://eu-refresh.org/german-refresh-national-platform-discusses-next-steps-concerning-collection-food-waste-data)

8 November 2018 – Wuppertal: 7th German REFRESH Steering Committee Meeting (https://eu-refresh.org/german-refresh-pilot-working-group-members-formulate-wishes-future)

8 April 2019 – Wuppertal: 8th German REFRESH Steering Committee Meeting (https://eu-refresh.org/refresh-steering-committee-germany-convenes-eighth-time)

Food waste reduction training of PENNY apprentices successfully completed

2017-2018

By early summer 2018, almost 900 PENNY trainees had been trained on reducing food waste as part of a REFRESH pilot project in Germany. Several month later a review survey was conducted.

Documentation is available at: https://eu-refresh.org/food-waste-reduction-training-penny-apprentices-successfully-completed

3.6.2   Hungary

Meetings of the Hungarian Pilot Working Platform

22 March 2016 – Budapest: Hungarian Steering Committee Launch (https://eu-refresh.org/hungary-steering-committee-launched)

20 September 2017 – Budapest: Hungarian Pilot Working Platform Meeting at National Agriculture and Food Exhibition and Fair (https://eu-refresh.org/hungarian-pwp-meeting-organised-line-national-agriculture-and-food-exhibition-and-fair)

12 February 2018 – Budapest: Hungarian National Steering Committee Meeting (https://eu-refresh.org/meeting-hungarian-national-steering-committee)

Hungarian Food Bank at the Night of the Market

22 June 2018 – Budapest

At the "Night of the Market", the REFRESH partner Hungarian Food Bank Association (HFA) cooked and spread a delicious meal for the workers on the market. The Budapest Wholesale Market provided them with the opportunity and free space for the operation of a container for food surplus disposal. The HFA has received goods worth over 15 million HUF at the Market, while it had the chance to be acquainted and get into direct contact with producers. Fresh vegetables and fruits represent a great help to the people supported by the HFA.

Documentation is available at: https://eu-refresh.org/hungarian-food-bank-night-market

3.6.3   The Netherlands

EU commissioner Andriukaitis and minister Schouten visit Dutch Taskforce on Circular Economy

28 November 2017 – Veghel

On the 28th of November 2017, EU commissioner Andriukaitis (Health and Food Safety) and Minister Schouten (Agriculture, Nature and Food Quality, NL) visited the 'Food Waste Factory' in Veghel, located in THREE SIXTY, the heart of the Dutch ecosystem for circular economy in food. They met with the Dutch frontrunners on food waste prevention.

Documentation is available at: https://eu-refresh.org/eu-commissioner-andriukaitis-and-minister-schouten-visit-dutch-taskforce-circular-economy

Dutch Champions 12.3 Event: Appetite for Action

20 March 2018 - Veghel

The Dutch REFRESH national platform "Taskforce Circular Economy in Food" (TCEF) organised an interactive event for TCEF Members, Dutch Champions 12.3 and international frontrunner organisations. Using "Appreciative Inquiry", the participants shared experiences and best practices, and developed new plans for action to contribute to the SDG 12.3 target by 2030.

Documentation is available at: https://eu-refresh.org/dutch-champions-123-event-appetite-action **Documentation available at**

Meetings of the Dutch Pilot Working Platform

26 January 2017 – The Hague: Launch of the Taskforce Circular Economy in Food during the Food Summit (https://eu-refresh.org/dutch-taskforce-connects-initiatives-against-food-waste)

9 March 2017 – Veghel: 2nd Meeting of the Dutch Pilot Working Platform

7 June 2017 – Veghel: 3rd Meeting of the Dutch Pilot Working Platform

19 September 2017 – Veghel: 4th Meeting of the Dutch Pilot Working Platform

14 November 2017 – The Hague: 5th Meeting of the Dutch Pilot Working Platform

12 June 2018 – Veghel: 6th Meeting of the Dutch Pilot Working Platform

29 August 2018 – Veghel: 7th Meeting of the Dutch Pilot Working Platform

27 December 2018 – Veghel: Launch of United against Food Waste (https://www.wur.nl/nl/Onderzoek-Resultaten/Onderzoeksinstituten/food-biobased-research/Oplossingen/1-miljoen-ton-minder-voedselverspilling-is-haalbaar.htm)

3 March 2019 – Veghel: 8th Meeting of the Dutch Pilot Working Platform

12 March 2019 – Veghel: 9th Meeting of the Dutch Pilot Working Platform

June 2019 – Veghel: Final Meeting of the Dutch Pilot Working Platform – take over within United against Food Waste

3.6.4 Spain

Meetings of the Spanish Pilot Working Platform

2 March 2016 – Barcelona: 1st Meeting of Spanish REFRESH Platform (https://eu-refresh.org/pilot-working-platform-first-steps-set-framework-action-spain)

22 September 2016 – Barcelona: 2nd Meeting of the Spanish REFRESH Platform (https://eu-refresh.org/second-meeting-refresh-spanish-national-platform)

23 November 2017 – Barcelona: 3rd Meeting of the Spanish REFRESH Platform (https://eu-refresh.org/3rd-meeting-spanish-refresh-platform-took-place)

11 December 2018 – Barcelona: 4th Meeting of the Spanish REFRESH Platform (https://eu-refresh.org/4th-meeting-spanish-refresh-platform-took-place)

9 May 2019 – Barcelona: 5th Meeting of the Spanish REFRESH Platform

Food loss and waste reduction and management course

21-25 January 2019 – Zaragoza

The course was targeted to decision makers, administration officers, food producers, managers and marketers, technical advisors, researchers and NGO and NPO professionals working on or concerned with the implementation of programmes to reduce food loss and waste and in the alternatives for waste valorisation. It covered the following issues:

- Identify the causes and hot spots of food loss and waste.

- Discover the main actors and their initiatives (FAO, WRI, EU, VAs, etc.)

- Learn about public and private actions to reduce FLW.

- Work with quantitative and qualitative assessment tools in different scenarios.
- Connect with professionals from other countries and brainstorm to propose new ideas.
- Raise public awareness about the importance of reducing loss.

Documentation is available at: https://eu-refresh.org/food-loss-and-waste-reduction-and-management-course

3.6.5 China

Sino-Nordic Seminar on Sustainable Food Systems and Food Waste

13-14 January 2018 – Shanghai

Over 40 active researchers and stakeholders from the Nordic countries and China in the field of sustainable food systems and food waste shared experience and discussed potential directions of collaboration.

Documentation is available at: https://eu-refresh.org/sino-nordic-seminar-sustainable-food-systems-and-food-waste-shanghai

Nordic Environmental Youth Summer Camp

4-16 August 2018 – China, Sweden, Finland

The IVL organised a camp for youth from China to raise young people's awareness about food waste. The camp included visits to various locations within the whole food supply chain, covering food production, food transportation, food re-distribution, food consumption (in restaurants and at home) and food treatment.

Documentation is available at: https://eu-refresh.org/china-international-youth-environmental-protection-action-plan-nordic-environmental-youth-summer

Seminar on "organizing China food waste reduction alliance"

23 March 2018 – Beijing

The press release on "Report on China Urban Catering Industry Food Waste" was presented at the discussion seminar on "Organizing China food waste reduction alliance" on March 24, 2018. Around 100 representatives joined the event, including UN Environment, FAO, China Food Bureau, CHEARI, CCFA and other universities, foundations, enterprises, and research institutions, alliances and NGOs.

Documentation is available at: https://eu-refresh.org/report-china-urban-catering-industry-food-waste-released-discussion-seminar-%E2%80%9Corganizing-china-food

Launch of Food Waste Reduction China Action Platform at the 2018 China Sustainable Consumption Roundtable

8 June 2018 – China

The Food Waste Reduction China Action Platform is a partnership initiated by IVL, CCFA and CHEARI, guided by FAO, UNEP 'Think, Eat, Save', and supported by REFRESH, in the aim of supporting China to achieve SDG 12.3.

Documentation of the event is available at: https://eu-refresh.org/launch-food-waste-reduction-china-action-platform-2018-china-sustainable-consumption-roundtable

Launch event of Voluntary Action Plan and Food Waste Reduction: Initiative Proposed by CCFA Chain Catering Enterprises

13 March 2019 - Shanghai

The CCFA Chain Catering Committee and CCFA China Sustainable Consumption Round-table jointly launched the "Voluntary Action Plan of CCFA Chain Catering Enterprises on Food Waste Reduction Initiative". The launch event on March 13, 2019 in Shanghai was witnessed and participated by 500 Chinese catering companies, with nearly 1400 people present. This event was supported by the FAO, UN Environment, NET PLANET NETWORK, the IVL, and the REFRESH project team.

Documentation is available at: https://eu-refresh.org/voluntary-action-plan-and-food-waste-reduction-initiative-proposed-ccfa-chain-catering-enterprises

4 REFRESH Publications

Within four years project duration REFRESH published **four policy briefs**, **nine academic journal articles** (with **another twelve planned** for publication after the project's end), **42 project reports**, **three frameworks for action** (see chapter 4.4.1), **four decision support systems**, **eight videos** (and four more under production, see chapter 6.7) as well as **two interim results brochures** (with a final one planned for autumn 2019).

4.1 Policy Briefs

In 2019 selected research results of REFRESH have been summarised and adapted especially for policy-makers in the form of four policy briefs.

4.1.1 Voluntary Agreements as a collaborative solution for food waste reduction

This policy brief outlines how to create a favourable context for the implementation of Voluntary Agreements (VAs) within any Member State to drive food waste reduction. The collaborative nature of VAs is furthermore highlighted, as the food waste savings target of a VA is more likely to be met via active involvement and collaboration of all supply chain actors.

Download at: https://eu-refresh.org/voluntary-agreements-collaborative-solution-food-waste-reduction

4.1.2 Regulating the role of Unfair Trading Practices in food waste generation

This policy brief outlines the relevance of Unfair Trading Practices to understanding addressing food waste in the supply chain and makes recommendations on mitigating Unfair Trading Practices for a fairer and less wasteful supply chain.

Download at: https://eu-refresh.org/regulating-role-unfair-trading-practices-food-waste-generation

4.1.3 Reducing consumer food waste

Public campaigns and other policy instruments can significantly influence consumer behavior and contribute to a reduction of consumer food waste. However, there are only very few studies that have evaluated to what extent policy interventions actually reduced or prevented food waste. The REFRESH Policy brief summarises REFRESH findings on consumer behaviour as well as related research results and derives policy recommendations to reduce consumer food waste. The policy brief is based on the REFRESH report "Policies against consumer food waste: Policy options for behaviour change including public campaigns".

Download at: https://eu-refresh.org/reducing-consumer-food-waste

4.1.4 Avoiding food waste through feeding surplus food to omnivorous non-ruminant livestock

This policy brief outlines the environmental, economic and safety considerations of reforming EU law to enable surplus food containing meat to be fed to omnivorous non-ruminant livestock like pigs, in order to drive food waste valorisation through animal feed.

Download at: https://eu-refresh.org/avoiding-food-waste-through-feeding-surplus-food-omnivorous-non-ruminant-livestock

4.2 Academic journal articles

REFRESH research results have been published in nine academic journal articles. twelve more articles are planned after the project's end.

- Buisman, M.E., Haijema, R., Bloemhof-Ruwaard, J.M., 2017: Discounting and dynamic shelf life to reduce fresh food waste at retailers, *International Journal of Production Economics*, 209, 274-284. ISSN 0925-5273. http://dx.doi.org/10.1016/j.ijpe.2017.07.016

- Buisman, M.E., Haijema, R., Akkerman, R., Bloemhof, J.M., 2018: Donation management for menu planning at soup kitchens, *European Journal of Operational Research*, 272, 324-338. https://doi.org/10.1016/j.ejor.2018.06.005

- De Menna, F., Dietershagen, J., Loubiere, M., Vittuari, M., 2018: Life cycle costing of food waste: A review of methodological approaches, *Waste Management,* 73, 1-13.
https://doi.org/10.1016/j.wasman.2017.12.032

- Grainger, M.J.,Aramyan, L., Logatcheva, K., Piras, S., Righi, S., Setti, M., Vittuari, M., Stewart, G.B., 2018: The use of systems models to identify food waste drivers, *Global Food Security*, 16, 1-8.
https://doi.org/10.1016/j.gfs.2017.12.005

- Grainger, M.J., Aramyan, L., Piras, S., Quested, T.E., Righi, S., Setti, M., et al. 2018: Model selection and averaging in the assessment of the drivers of household food waste to reduce the probability of false positives. *PLoS ONE* 13(2): e0192075. https://doi.org/10.1371/journal.pone.0192075

- Scherhaufer, S., 2019: Handlungsempfehlungen zur Reduktion von Lebensmittelabfällen und ihre Klimarelevanz anhand von theoretischen Umsetzungsbeispielen im europäischen Raum. *Österreichische Wasser- und Abfallwirtschaft.* 71, 273-281.
https://doi.org/10.1007/s00506-019-0575-z

- Van Herpen, E., van der Lans, I. A., Holthuysen, N., Nijenhuis-de Vries, M., and Quested, T. E., 2019: Comparing wasted apples and oranges: An assessment of methods to measure household food waste. *Waste Management*, 88*,* 71-84. https://doi.org/10.1016/j.wasman.2019.03.013

- Van Herpen, E., and van der Lans, I., 2019: A picture says it all? The validity of photograph coding to assess household food waste. *Food Quality and Preference*, 75*,* 71-77.
https://doi.org/10.1016/j.foodqual.2019.02.006

- Xue, L., Prass, N., Gollnow, S., Davis, J., Scherhaufer, S., Östergren, K., Cheng, S., Liu, G., 2019: Efficiency and Carbon Footprint of the German Meat Supply Chain, *Environmental Science and Technology 2019,* 53, 5133-5142.
https://doi.org/10.1021/acs.est.8b06079

Planned academic journal articles:

- Close, A., Masotti, M., Vittuari, M., Stewart, G.B.: Subjective measures do not correspond with objective measures of food waste.

- Davis, J., De Menna, F., Brenes Peralta, L., Luyckx, K., Östergren, K., Vittuari, M., van Zanten, H.: Environmental and economic assessment of food waste valorisation as pig feed in UK and France. Forthcoming.

- De Menna, F., Garcia Herrero, L., Davis, J., Östergren, K., Vittuari, M.: Environmental and economic assessment of nectarine losses prevention in the Spain-Italy-UK supply chain. Forthcoming.

- De Menna, F., Davis, J., Östergren, K., Unger, N., Loubiere, M., Vittuari, M.: Combining life cycle assessment and costing for food waste

prevention and valorisation. *Agricultural and Food Economics.* Under review.

- Scherhaufer, S., Davis, J., Metcalfe, P., De Menna; F., Östergren, K., Colin, F., Gollnow, S., Vittuari, M.: Environmental and economic assessment of the valorisation and recycling of food losses from food production. Forthcoming.

- Scherhaufer, S., Östergren, K., Davis, J., Metcalfe, P., De Menna, F., Colin F., Gollnow, S., Vittuari, M.: Environmental and economic assessment of the valorisation of food losses from food production in comparison to recycling or disposal, *Resources, Conservation and Recycling.*

- Van Geffen, L.E.J., van Herpen, E., Sijtsema, S., van Trijp, J.: Food waste as the consequence of competing motivation, insufficient abilities and lacking opportunities. Revision invited.

- Van Herpen, E., van Geffen, L.E.J., Nijenhuis-de Vries, M., Holthuysen, N., van der Lans, I.A., Quested, T.: A validated survey to measure household food waste. Under review.

- Van Herpen, E., De Hooge, I.: The defaulted doggy bag.

- Van Lin, A., Aydinli, A., Van Herpen, E., Von Schuckmann, J., Bertini, M.: From cash to trash? Price promotions and food waste. In progress.

- Vittuari, M., Falasconi, L., Piras, S., Marotti, M., Segrè, A., Setti, M.: 'Not in my bin': consumer's understanding and concern of food waste impacts and mitigation actions, *Journal of cleaner production*. Under review.

- Xue, L., Scherhaufer, S., Östergren, K., Cao, Z., Li, G.: Climate change mitigation based on the trade-linked EU tomato chain. *Environmental Research Letters.* Submitted.

4.3 **Project reports**

The following 42 project reports have been published by REFRESH partners on the REFRESH website.

- Aramyan, L., Valeeva, N., 2016: Socio-economic implications of food waste: Economics of innovation. REFRESH Deliverable 4.1, https://eu-refresh.org/node/129

- Bajzelj, B., 2016: Protocol for evaluating business food waste. REFRESH Deliverable 2.2, https://eu-refresh.org/node/697

- Boulding, A., Devine, R., 2019: Evaluation FA Pilots - Final Synthesis Report. REFRESH Deliverable 2.8, https://eu-refresh.org/node/974

- Boulding, A., Eisenhauer, P., Brüggemann, N., Timmermans, T., Cseh, B., de Riaz, R., 2019: Evaluation Framework for Action Innovation projects. A

series of Case Studies from Germany, The Netherlands, Hungary and Spain. REFRESH Deliverable 2.4, https://eu-refresh.org/node/951

- Burgos, S., Gheoldus, M., Flavien, C., Stenmarck, A., Hultén.J., Yohanan, L., Parfitt, J., Vittuari, M., Piras, S., McFarland, K., Wunder, S., 2017: Systems maps and analytical framework. Mapping food waste drivers across the food supply chain. REFRESH Deliverable 3.1, https://eu-refresh.org/node/782

- Bygrave, K., Rogers, D., Eisenhauer, P., Bruggemann, N., Timmermans, T., Cseh, B., Lopez-i-Gelats, F., Díaz-Ruiz, R., 2017: Frameworks for Action: Selection Process. REFRESH Deliverable 2.3, https://eu-refresh.org/node/713

- Bygrave, K., 2016: Inventory of Business Change Tools. REFRESH Deliverable 2.5, https://eu-refresh.org/node/675

- Davis, J., De Menna, F., Unger, N., Östergren, K, Loubiere, M., Vittuari, M., 2017: Generic strategy LCA and LCC - Guidance for LCA and LCC focused on prevention, valorisation and treatment of side flows from the food supply chain. REFRESH Deliverable 5.3, https://eu-refresh.org/node/682

- De Menna, F., Loubiere, M., Dietershagen, J., Vittuari, M., Unger, N. 2016: Methodology for evaluating LCC. REFRESH Deliverable 5.2, https://eu-refresh.org/node/85

- De Menna, F., Davis, J., Bowman, M., Brenes Peralta, L., Bygrave, K., Garcia Herrero, L., Luyckx, K., McManus, W., Vittuari, M., van Zanten, H., Östergren, K., 2019: LCA & LCC of food waste case studies. Assessment of food side flow prevention and valorisation routes in selected supply chains. REFRESH Deliverable 5.5, https://eu-refresh.org/node/949

- Grainger, M., Piras, S., Righi, S., Setti, M., Stewart, G., Vittuari, M., 2018: Behavioural economics: Linking Bayesian and agent-based models to assess consumer food waste. REFRESH Deliverable 4.4, https://eu-refresh.org/node/973

- Grainger, M., Stewart, G., 2016: Consumers behavioural economic interrelationships and typologies. REFRESH Deliverable 4.1, https://eu-refresh.org/node/127

- Grainger, M., Stewart, G., Piras, S., Righi, S., Setti, M., Vittuari, M., 2016: Data protocol socio-economic modelling. REFRESH Deliverable 4.2, https://eu-refresh.org/node/693

- Grainger, M., Stewart, G., Piras, S., Righi, S., Setti, M., Vittuari, M., 2018: Model integration. Integrated socio-economic model on food waste. REFRESH Deliverabele 4.3, https://eu-refresh.org/node/836

- Leach, B., O'Brien, R., 2019: The effects of on-pack storage and consumption guidance on consumer food waste behaviours. REFRESH Deliverable 1.6, https://eu-refresh.org/node/902

- Liu, G., Xue, L., Cao, Z., Prass, N., Gollnow, S., Davis, J., Scherhaufer, S., Östergren, K., De Menna, F., García Herrero, L., Vittuari, M., 2019: Integration of LCC and LCA results to higher system levels. REFRESH Deliverable 5.6, https://eu-refresh.org/node/950

- Luyckx, K., Bowman, M., Woroniecka, K., Broeze, J., Taillard D., 2019: The safety, environmental and economic aspects of feeding treated surplus food to omnivorous livestock. REFRESH Deliverable 6.7, https://eu-refresh.org/node/944

- Masotti, M., Piras, S., Righi, S., Setti, M., Aramyan, L., Logatcheva, K., Vittuari, M., 2019: Behavioural economics: assessing food waste innovations diffusion through ABM models - Insights from Italy and the Netherlands. REFRESH Deliverable 4.5, https://eu-refresh.org/node/947

- Metcalfe, P., Moates, G., Waldron, K., 2017: Detailed hierarchy of approaches categorised within waste pyramid. REFRESH Deliverable 6.3, https://eu-refresh.org/node/837

- Moates, G., Sweet, N., Bygrave, K.,Waldron, K., 2016: Top 20 Food waste streams. REFRESH Deliverable 6.9, https://eu-refresh.org/node/725

- Osoro, C., Bygrave, K., 2016: Inventory and evaluation of effectiveness of existing approaches. REFRESH Deliverable 2.1, https://eu-refresh.org/node/105

- Östergren, K., Scherhaufer, S., De Menna, F., García Herrero, L., Gollnow, S., Davis, J., Vittuari, M., 2018: Simplified LCA & LCC of food waste valorisation, Description of standardised models for the valorisation spreadsheet tool for life-cycle assessment and life-cycle costing. REFRESH Deliverable 5.4, https://eu-refresh.org/node/847

- Pinchen, H., Korousic Seljak, B., Torkar, D., Eftimov, T., Mantur-Vierendeel, A., Astley, S., Finglas, P., 2019: Valorisation Database: FoodWasteEXplorer. REFRESH Deliverable 6.2, https://eu-refresh.org/node/903

- Piras, S., García Herrero, L., Burgos, S., Colin, F., Gheoldus, M., Ledoux, C., Parfitt, J., Jarosz, D., Vittuari, M., 2018: Unfair Trading Practice Regulation and Voluntary Agreements targeting food waste: A policy assessment in select EU Member States. REFRESH Deliverable 3.2, https://eu-refresh.org/node/829

- Piras, S., Righi, S., Setti, M., Vittuari, M., 2016: Socio-economic implications of food waste: Business behavioural typologies and interrelationships. REFRESH Deliverable 4.1, https://eu-refresh.org/node/128

- Quested, T., 2019: Guidance for evaluating interventions preventing household food waste. REFRESH report, https://eu-refresh.org/node/933

- Rahmani, D., Gil, J.M., 2018: Valorisation of food surpluses and side-flows and citizens' understanding. REFRESH Deliverable 1.7, https://eu-refresh.org/node/876

- Ryden, P., Moates, G., Waldron, K., de Roode, M., 2018: Impact assessment texture processing. REFRESH Deliverable 6.4, https://eu-refresh.org/node/838

- Snels, J., Tromp, S., Buisman, M.E., Haijema, R., 2019: Gaining insight in possible actions to reduce food waste by developing a prototype monitoring tool and theoretical pilots. REFRESH Deliverable 2.7, https://eu-refresh.org/node/946

- Sweet, N., Bygrave, K., Moates, G., Waldron, K., 2016: Valorisation appropriate waste streams. REFRESH Deliverable 6.1, https://eu-refresh.org/node/115

- Unger, N., Davis, J., Loubiere, M., Östergren, K., 2016: Methodology for evaluating environmental sustainability. REFRESH Deliverable 5.1, https://eu-refresh.org/node/88

- Van Geffen, L.E.J. et al. 2016: Common Qualitative Research Protocol. REFRESH Milestone No. 1, https://eu-refresh.org/node/677

- Van Geffen, L.E.J., van Herpen, E., van Trijp, J.C.M., 2016: Causes & Determinants of Consumers Food Waste. REFRESH Deliverable 1.1, https://eu-refresh.org/node/138

- Van Geffen, L.E.J., Sijtsema, S.J., 2016: National, Qualitative insight on Household & Catering Food Waste. REFRESH Deliverable 1.2, https://eu-refresh.org/node/681

- Van Geffen, L.E.J., van Herpen, E., van Trijp, H., 2017: Quantified consumer insights on food waste: Pan-European research for quantified consumer food waste understanding. REFRESH Deliverable 1.4, https://eu-refresh.org/node/784

- Van Herpen et al., 2016: Consumption Life Cycle Contributions. Assessment of practical methodologies for in-home waste measurement. REFRESH Deliverable 1.3, https://eu-refresh.org/node/678

- Van Herpen, E., van der Lans, I., Nijenhuis-de Vries, M., Holthuysen, N., Kremer, S., 2016: Best practice assessment consumer level food waste. REFRESH Milestone No. 2, https://eu-refresh.org/node/694

- Vogels, J., van der Haar, S., Zeinstra, G., Bos-Brouwers, H., 2018: ICT tools for food management and waste prevention at the consumer level. REFRESH Deliverable 1.5, https://eu-refresh.org/node/886

- Wain, J., Waldron, K., Moates, G., Metcalfe, P., 2019: Viability of bio-based chemicals from food waste. REFRESH Deliverable 6.8, https://eu-refresh.org/node/976

- Wigham, M., Tromp, S., Wilson, J., Bygrave, K., 2018: Gap analysis for decision support tools, models and libraries. REFRESH Deliverable 2.6 , https://eu-refresh.org/node/899

- Wunder, S., van Herpen, E., McFarland, K., Ritter, A., van Geffen, L.E.J., Stenmarck, A., Hulten, J. 2019: Policies against consumer food waste. Policy options for behaviour change including public campaigns. REFRESH Deliverable 3.4, https://eu-refresh.org/node/907

- Wunder, S., McFarland, K., Hirschnitz-Garbers, M., Parfitt, J., Luyckx, K., Jarosz, D., Youhanan, L., Stenmarck, A., Colin, F., Burgos, S., Gheoldus, M., Cummins, A.C., Mahon, P., van Herpen, E., 2018: Food waste prevention and valorisation: relevant EU policy areas. REFRESH Deliverable 3.3, https://eu-refresh.org/node/819

4.4 Decision Support Systems

Four decisions support systems have been developed to target group readiness and published within REFRESH. The VAs Blueprint is directed towards policy-makers, whereas the Animal Feed Tool, the FORKLIFT Tool and the FoodWasteEXplorer Database are addressing food businesses.

4.4.1 Voluntary Agreements Blueprint

Work package 2 compiled an "Inventory and Evaluation of the Effectiveness of Existing Approaches to Voluntary Alliances (VA)" (available at: https://eu-refresh.org/inventory-and-evaluation-effectiveness-existing-approaches-voluntary-alliances) that reviewed successful VAs and summarised the common factors that led to their success. From this research, five steps were identified as being key to include in the establishment and management of VAs. The voluntary Framework for Action approach was then piloted in the four REFRESH countries. Initial research and the experiences from the pilot countries were then distilled into a REFRESH VAs Blueprint. The key steps explained in the Blueprint allow different countries to be flexible in their approach, catering towards their own socio-economic and political situations. The Blueprint was designed as an interactive PDF document and can be downloaded at: https://eu-refresh.org/VAblueprint. The draft Blueprint was presented to delegates from interested EU Member States at the Policy workshop on VAs in June 2018 (see chapter 3.4.3). In April 2019 the Blueprint was presented in a webinar (see chapter 3.5.2).

Frameworks for action

The individual frameworks for action in three REFRESH pilot countries were also published:

- Eisenhauer, P., Bottermann, P., 2016: Framework for Action Business Engagement Germany – Final Version (translation). Collaborating Centre on Sustainable Consumption and Production (CSCP) gGmbH, Wuppertal. https://eu-refresh.org/framework-action-german-national-platform

- Cseh, B., 2016: "Food is Value - Forum Against Food Loss and Waste. Framework for Action Hungary." Hungary: Hungarian Food Bank Association.
https://eu-refresh.org/framework-action-hungary

- López-i-Gelats, F., Díaz-Ruiz, R., Reinoso, D., de Gaudio, L., Gil, J.M., 2016: Framework for Action - Spain, 22.09.2016. Spain: Centre de Recerca en Economia i Desenvolupament Agroalimentari (CREDA-UPC-IRTA).
https://eu-refresh.org/framework-action-spain

4.4.2 Animal Feed Tool

To help food businesses to use former foodstuffs as farm animal feed, REFRESH has built a web app for businesses to clarify which surplus food is suitable, and what needs to be done to send the food to animal feed in a safe and legal way.

More information at: https://eu-refresh.org/animal-feed-tool

4.4.3 FORKLIFT Tool

FORKLIFT (FOod side flow Recovery LIFe cycle Tool) is a spreadsheet learning tool that indicates life cycle greenhouse gas emissions and costs for using selected food side flows. It allows users to interpret the results regarding the effects of intervention with the additional effect of making it possible to compare the results with alternative products available on the market.

More information at: https://eu-refresh.org/forklift-assessing-climate-impacts-and-costs-using-food-side-streams

4.4.4 FoodWasteEXplorer Database

FoodWasteEXplorer is an online, searchable database of food waste compositional data. It allows users to search for nutrients, bioactives, toxicants and other waste related data in specific side streams.

More information at: https://eu-refresh.org/foodwasteexplorer

4.4.5 Quick scan and Food waste monitor for retail

Related to T2.5 a simulation and a monitoring tool based on retail data were developed. It allows for data-driven visualisation of food waste levels across product types and store locations, expressed in turnover and volumes. It is suited with analytical features such as the Fresh Case Cover that allows to indicate hotspots for interventions and possible effects on FLW reduction using ordering units and remaining shelf life as indicators.

More information at: http://www.refreshcoe.eu/resources/food-waste-quick-scan-at-retailers/ and http://www.refreshcoe.eu/the-food-waste-monitor-tool-2/

4.5 REFRESH results brochures

Two brochures presenting and summarising interim REFRESH results have been published in 2017 and 2018. A final results brochure is planned for autumn 2019.

- Wunder, S., van Herpen, E., Rogers, D., Bygrave, K., Gheoldus, M., Vittuari, M., Östergren, K., Moates, G., Waldron, K., McFarland, K., Smith, L., Kemper, M. 2017: REFRESH Interim Results 2017. https://eu-refresh.org/refresh-interim-results-2017-presented-brochure

- McFarland, K., Wunder, S., van Herpen, E., Rogers, D., Bygrave, K., Gheoldus, M., Burgos, S., Vittuari, M., Östergren, K., Finglas, P., Metcalfe, P., Pinchen, H. 2018: REFRESH Interim Results 2018. https://eu-refresh.org/refresh-interim-results-2018-presented-brochure

5 REFRESH Contests and Quiz

5.1 Food Waste Solution Contest

In 2016 REFRESH called for a Food Waste Solution Contest. The objectives of the contest included:

- Highlight and support solutions to food waste and food packaging waste at any part of the food chain;

- Encourage development, implementation and spread of innovative solutions;

- Engage stakeholders in dialogue with the REFRESH project, other stakeholders, and the public.

Submissions had to be in English and in the format of a video or a visual essay. Contest submissions were made by individuals, organisations, start-ups and large companies. The REFRESH Food Waste Solution Contest received over fifty project submissions from across Europe (see figure below). The expert jury judged the projects based on their innovativeness, realisation potential, impact, and visual quality. Winners received prizes, including the opportunity to participate in a Food Waste Innovation incubator event and the REFRESH Food Waste 2017 Conference in Berlin (see chapter 3.1 and 3.2). Wastewatchers and Transition Surplus Food Project were selected as winners by the expert jury. Zero Waste Aiud from Romania gathered over 17.000 votes to win the Public Award. The winners presented their projects at the REFRESH Food Waste 2017 Conference on 18 May 2017 in Berlin.

Figure 1: Country of submissions to the REFRESH Food Waste Solution Contest
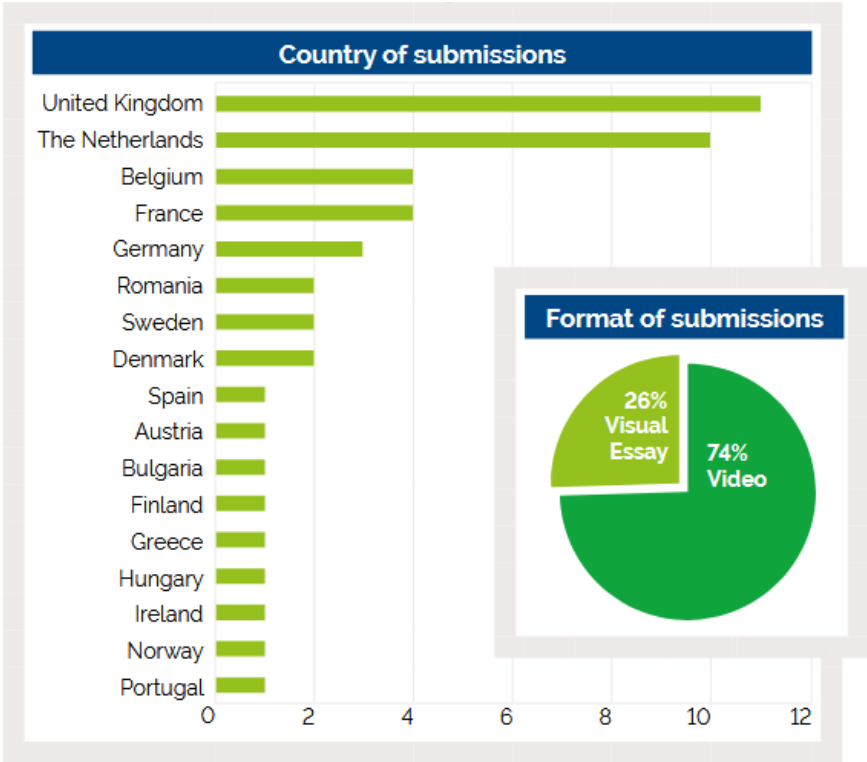
Source: REFRESH 2017

47 Finalists were selected to participate in voting for the Public Award. The public voting period started on 1 February 2017 and ended on 28 February 2017. Within the 28 days of the public award over 61.000 votes were cast. Several contest participants seized the opportunity of the public award to widely reach out to their communities and the public. The figure below shows that the interaction with the food waste solutions and innovations increased amazingly within the last days of the public voting.

Figure 2: Development of votes for top six projects of the REFRESH contest
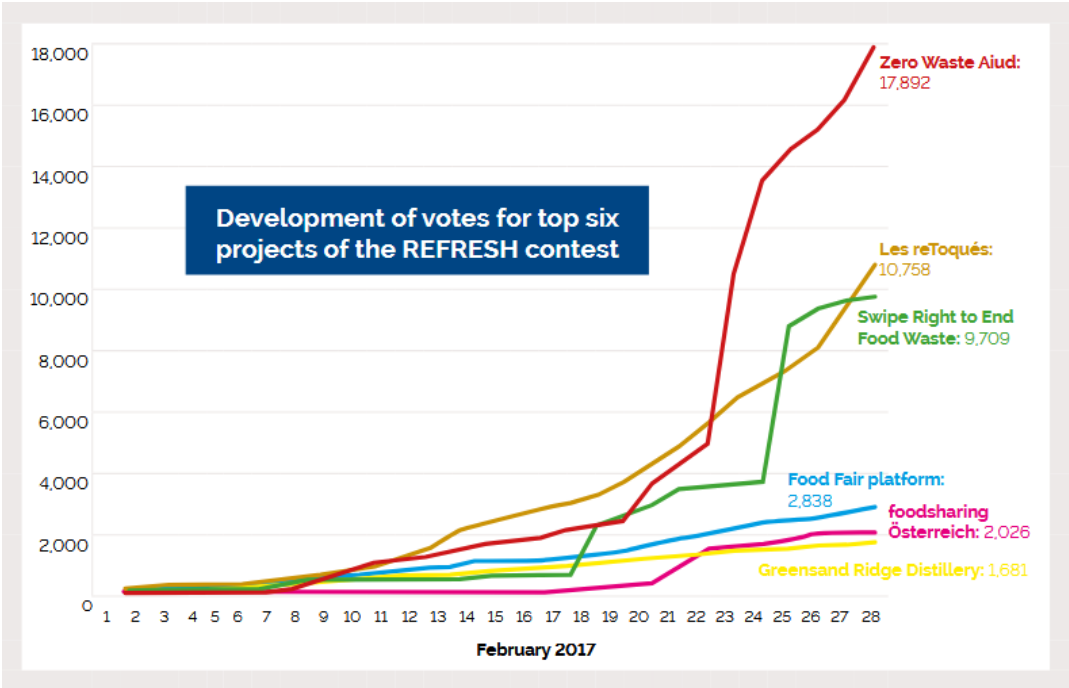
Source: REFRESH 2017

Voters of the REFRESH Food Waste Solution Contest public award also became interested in the REFRESH project and probably in the issue of food waste in general. Visits on the REFRESH website significantly increased during the public voting period (see figure below). The amount of fans and followers on the REFRESH Facebook and Twitter channel also increased during the contest. Overall, the REFRESH Food Waste Solution Contest was a helpful measure to communicate to the public and broaden the REFRESH network that has been used to disseminate REFRESH research results in a later stage of the project.

Figure 3: Contest created interest in REFRESH – Page views on eu-refresh.org
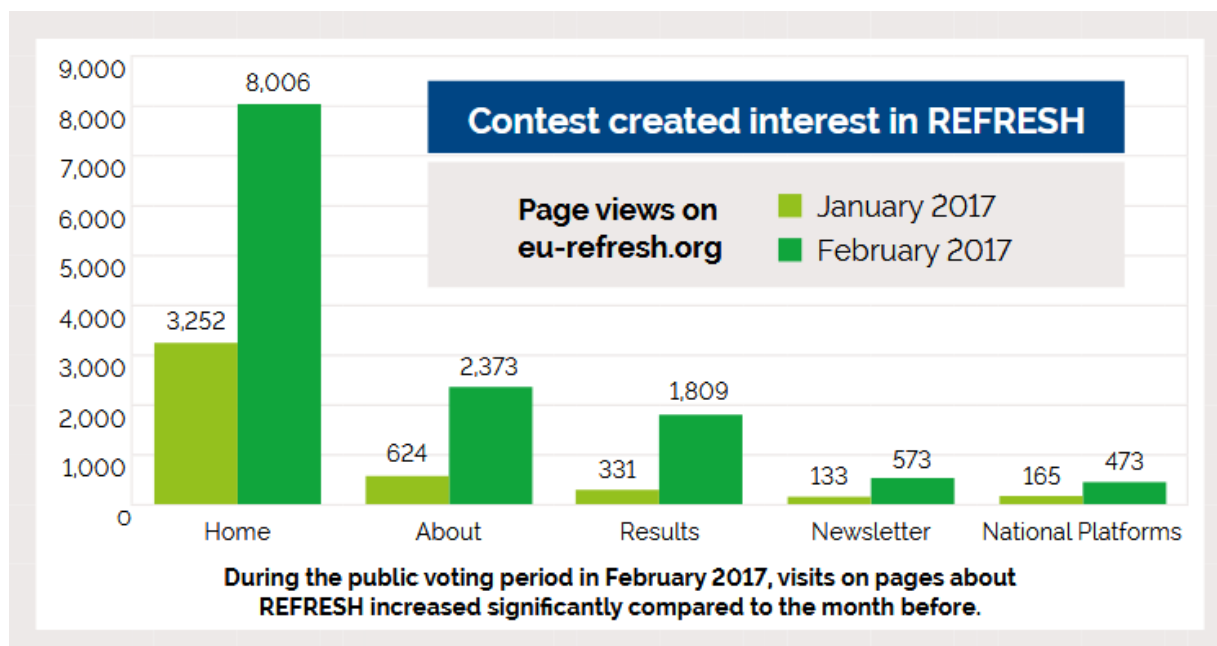
Source: REFRESH 2017

Documentation of the REFRESH Food Waste Solution Contest is available at: https://eu-refresh.org/contest

A second Food Waste Solution Contests has been conducted in school in China. **More information is available at:** https://eu-refresh.org/chinese-food-waste-solution-contest and https://eu-refresh.org/winners-school-food-waste-solution-contest-china

5.2 Doggy Bag Design Contest

When will you get the chance again to display an object in a world-famous Design Museum? And illustrate design contributions towards food waste reduction? These were the initial thoughts behind the spontaneously organised REFRESH Doggy Bag Design Contest that was held at the REFRESH final conference in Barcelona's Design Museum. Before the event, all registered participants of the REFRESH final conference were asked to bring along their favourite containers and solutions to transport leftover food. At the event, each participant received three self-adhesive stars for voting in the coffee break.

Even in the evening before the conference Ecologic's event organisation team was not sure if a reasonable amount of doggy bags would be brought to the conference site the next day. Therefore, the team also participated themselves and designed some creative doggy bags for the contest. However, it all worked out perfectly and the idea of te contest a full success. In total 22 diverse and colourful doggy bag contributions from 13 countries were displayed the next day. Participants studied the doggy bags carefully, posted photographs on social media and participated extensively in the voting.

Three winners were identified:

- The Ecobox by the Luxemburgish Government

- The TreatBox® - Doggybag version 2.0 by KLS PurePrint A/S – Denmark Att. Jakob Thomasen

- The Broccoli Box titled 'I did not go through all this for nothing, did I?' presented by Barbara Korousic Seljak from Jozef Stefan Institute and designed by Barbara Slanc, both from Slovenia

Documentation of the REFRESH Doggy Bag Design Contest is available at: https://eu-refresh.org/doggy-bag-design-contest

5.3 Quiz: Food Waste Valorisation

The production of food results in by-products. Instead of disposing them as waste, they can also be valorised into new products. An online quiz has been developed within REFRESH in order to playfully communicate the issue of food waste valoristion to a broader public. Professional audiences with deeper interest in food waste valorisation are linked from the quiz to the FoodWasteEXplorer database (see chapter 4.4.4). To enable wide distribution the quiz has been translated into ten languages and offers code for embedding it into other websites.

The player scrolls two image galleries and chooses two pictures that correspond as food waste and new product. When clicking 'submit' the player is informed whether the assignment was correct and gets additional information about the waste stream and valorisation option. There are eight possible pairs to be found.

The REFRESH Food Waste Valorisation Quiz is available at: https://eu-refresh.org/quiz/

6 Dissemination activities through REFRESH channels

In the beginning of the project a **visual identity** was created and applied to all REFRESH information material (e. g. Flyer, presentation, roll-up, report, website, social media channels). The **REFRESH website** at eu-refresh.org served as the main backbone of all communication activities. All Events were announced and documented here, all results are made available through it. A **bi-annual REFRESH newsletter** has been sent out. Additionally **17 direct mailings** (e. g. of press releases) were undertaken.

Social media channels were setup in Twitter, Facebook and YouTube in order to draw visitors to the REFRESH website and to host video content. Social media was a useful tool to maintain the online day-to-day presence of the project and to interact with diverse stakeholders about REFRESH activities and stay abreast of relevant developments in the community. In the beginning of the project, posting relevant news related to food waste, even if it is not directly REFRESH news, was

very useful to attract visitors. The REFRESH social media channels were able to generate a large audience and drive traffic to the website.

To ensure that the community that has been built within REFRESH can live beyond the project an additional online platform, the **REFRESH Community of Experts** (CoE), was launched in 2017. The EU Platform on Food Losses and Food Waste (FLW) has decided to use the CoE as its main source for new and updated food waste prevention web content. The Platform plans to take over the CoE after REFRESH has ended.

6.1 Visual Identity

In the beginning of the project a project logo and a visual project identity have been created and implemented in all information materials of the project (presentation slides about the project, report template, flyer, roll-ups etc.). A central visual element contains photographs of ugly vegetables (see website header at www.eu-refresh.org), that are often disposed and therefore became an iconic symbol for food waste and the project's visual identity.

For the REFRESH Food Waste Solution Contest (see chapter 5.1) a stop-motion trailer video (see chapter 6.7) has been created. It featured demonstrating ugly vegetables complaining about being wasted. The protesting vegetables became the secret stars of the project and have henceforth been used throughout the project e. g. as table decorations and photo props.

Figure 4: Protesting ugly veggies became the secret darlings of REFRESH's visual identity

6.2 **REFRESH Website**

The project's website at <u>eu-refresh.org</u> served as the central mean and backbone of all communication and dissemination activities. All publications can be found here, all events are announced and documented, links are provided etc. All partners regularly contributed content to the website. Until July 2019 a total of **348 articles** have been posted of which 140 were of content type event, 130 news and 78 results. In the following web statistics are presented for the last three years of the project (Aug 2016 to Jul 2019) because in the first year the topical content provided on the website mainly regarded external events and news as the project did not yet have own results to be published.

6.2.1   Visits and page views

User engagement with the REFRESH website has been very good. The total amount of **website visits** in the last three years (1 Aug 2016 to 31 Jul 2019) was **282.970**. These visits resulted in **511.051 page views**. The public voting of the REFRESH Food Waste solution contest contributed significantly to these high click numbers (see chapter 5.1). But even when taking out the month of the public voting the monthly number of visits has been on average over 5.100 and the number of average monthly views over 9.400. Engagement with the website overall showed an increasing trend. The figures below present the monthly visits and page views. Major peaks in web traffic correspond with the contest and REFRESH events (see chapter 3).

Figure 5: Visits on eu-refresh.org Aug 2016 – Jul 2019

Figure 6: Page views on eu-refresh.org Aug 2016 – Jul 2019
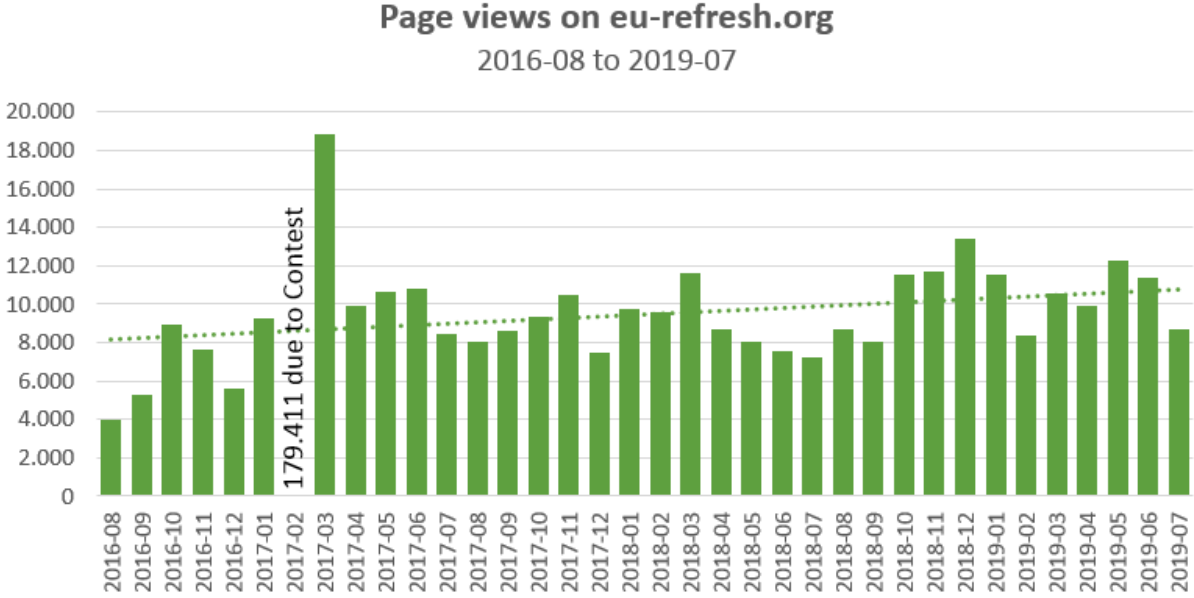
6.2.2 Most viewed sections of eu-refresh.org

Aside from the home page with its news section, the most visited navigation items of eu-refresh.org were the "About" page, "Results", "Events", and the pages of the "National Platforms" (see figure below). It has been observed that the "Results" section made its way up in the statistics (and will probably continue to do so) as more and more results were published. For more details on engagement with REFRESH results see chapter 6.2.3.

Figure 7: Most viewed sections of eu-refresh.org Aug 2016 – Jul 2019
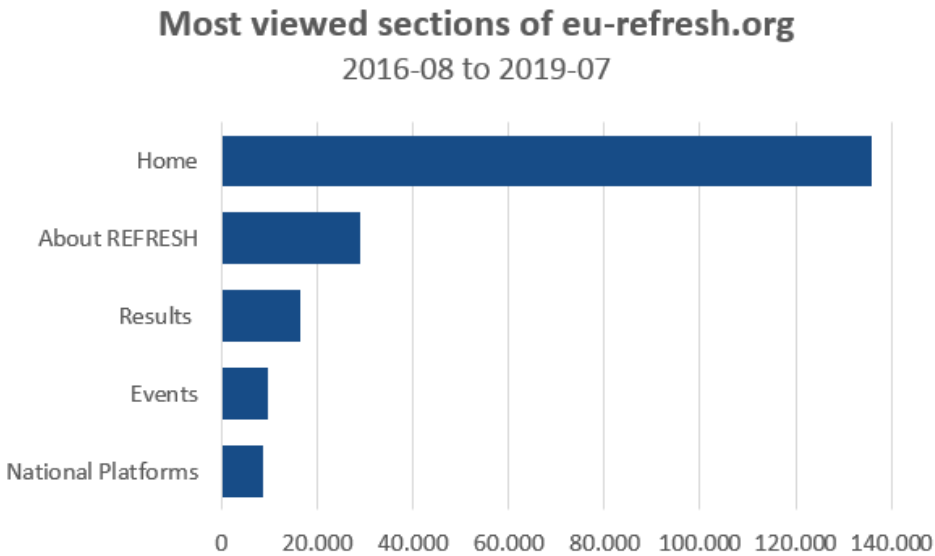
Source: REFRESH 2019

6.2.3 Referrer

It is also important to understand how visitors discover or find the REFRESH website in order to adapt and or continue dissemination strategies. The left part of the figure below shows how visitors of the REFRESH website were acquired. The number in brackets indicates the total page views. The big pie chart shows that 44% (dark blue segment) of the visitors were acquired by direct links. Visitors via direct links can be seen as an indicator for active dissemination, e.g. mailings and newsletters. 35% came via search engines (grey segment) and 20% via links on other websites and social media (light green segment). Amongst the referring websites and social media Facebook (light blue segment in small pie chart) has a predominant role. This is mainly do to the public voting of the REFRESH Food Waste Solution Contest (see chapter 5.1). Many contest submitters used Facebook to activate their communities.

The left part of the figure below shows the same indicators without the month of the public voting (Feb 2017). This gives a more realistic view on how the "normal" REFRESH visitors were acquired. Then websites and social media referred only 6% of the visitors and referring websites such as the partners' or the EC's websites as well as Twitter (yellow segment) become more important.

Figure 8: How visitors accessed the REFRESH website

REFRESH referrer (522.870)
2016-08 to 2019-07 (including 2017-02)

REFRESH referrer (343.459)
2016-08 to 2019-07 (without 2017-02)

- Direct Entry
- Websites and Social Media
- Search Engines
- Websites
- Twitter
- Facebook
- LinkedIn
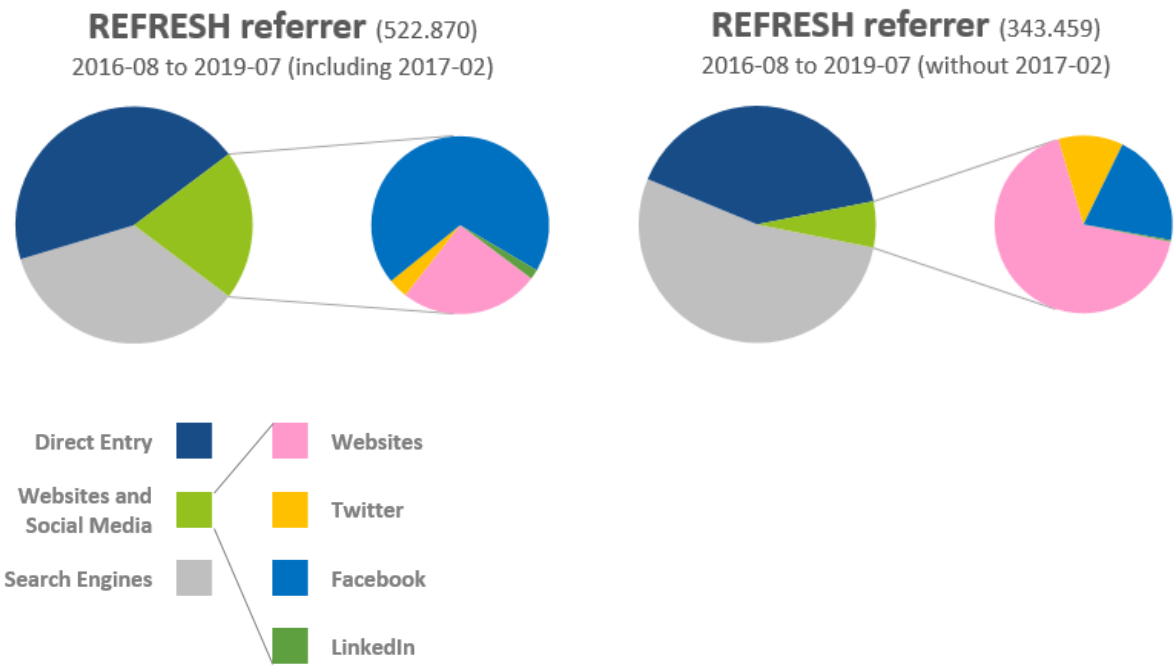
Source: REFRESH 2019

6.2.4 Webstatistics for REFRESH results

In the following the webstatistics for the REFRESH website section Results (https://eu-refresh.org/results) is presented.

The following table shows that 69 REFRESH results articles have been posted until July 2019. They contain a totality of 66 attachments. The results are classified according to the project's work package (WP) they belong to.

Table 4: Number of Result Articles and Attachments per Work Package

Work Package	Articles	Attachments
WP 1 Consumer understanding	12	12
WP 2 Business engagement	11	11
WP 3 Policy framework	8	8
WP 4 Behavioural economics	8	7
WP 5 Life cycle costs + assessment	6	6
WP 6 Valorisation	10	13
WP 7 Communication	13	7

From August 2016 to July 2019 **results articles have been viewed 20.820 times**. **Attachments** have been **downloaded 8.028 times**.

Table 5: Views + Downloads of Results per Work Package

Work Package	Views	Downloads
WP 1 Consumer understanding	5.657	1.948
WP 2 Business engagement	2.546	898
WP 3 Policy framework	1.951	864
WP 4 Behavioural economics	2.318	517
WP 5 Life cycle costs + assessment	2.481	670
WP 6 Valorisation	3.933	1.352
WP 7 Communication	1.230	1.656

The following tables show the download numbers for REFRESH results (PDF attachments) from August 2016 to July 2019 per work package sorted by downloads. In order to be able to better interpret the download numbers, the date of file upload is also given.

Table 6: WP 1 Consumer understanding Results - Downloads

WP1 Document Title + URL	Date upload	Downloads
Causes & Determinants of Consumers Food Waste	9 Nov 2016	491
Quantified consumer insights on food waste	17 Jan 2018	438
Consumption life cycle contributions	14 Dec 2016	231
National, Qualitative insight on Household & Catering Food Waste	11 Jan 2017	205
Best practice measurement of household level food waste	20 Feb 2017	174
Common Qualitative Research Protocol	14 Dec 2016	109
ICT tools for food management and waste prevention at the consumer level	20 Nov 2018	100

Quantified consumer insights on food waste (Accompanying Document)	17 Jan 2018	84
Valorisation of food surpluses and side-flows and citizens' understanding	14 Nov 2018	54
The effects of on-pack storage and consumption guidance on consumer food waste behaviours	5 Mar 2019	33
A picture says it all?	25 Mar 2019	15
Comparing wasted apples and oranges	25 Mar 2019	14

Source: REFRESH 2019

Table 7: WP 2 Business engagement Results - Downloads

WP 2 Document Title + URL	Date upload	Downloads
Protocol for evaluating business food waste	15 Mar 2017	155
Frameworks for Action: Selection Process	30 May 2017	134
Inventory and Evaluation of Effectiveness of Existing Approaches to Voluntary Alliances	4 Oct 2016	124
Framework for Action Business Engagement Germany	27 Jul 2017	119
Framework for Action Spain	24 Mar 2017	108
Inventory of Business Change Tools	7 Dec 2016	98
Framework for Action Hungary	7 Feb 2017	72
Gap analysis for decision support tools, models and libraries	28 Jan 2019	33
Evaluation Framework for Action Innovation projects	6 Jun 2019	35
Evaluation of Framework for Action Pilots	11 Jun 2019	20
Building partnerships, driving change: A voluntary approach to cutting food waste	4 Apr 2019	

Source: REFRESH 2019

Table 8: WP 3 Policy framework Results - Downloads

WP 3 Document Title + URL	Date upload	Downloads
Mapping food waste drivers across the food supply chain	5 Dec 2017	313
Food waste prevention and valorisation: relevant EU policy areas	24 May 2018	145
Guidance for evaluating interventions preventing household food waste	7 May 2019	100
Regulating the role of Unfair Trading Practices in food waste generation	18 Mar 2019	89
Unfair Trading Practice regulation and Voluntary Agreements targeting food waste	25 Jul 2018	70
Voluntary Agreements as a collaborative solution for food waste reduction	19 Mar 2019	70
Policies against consumer food waste	18 Mar 2019	66
Reducing consumer food waste	18 Mar 2019	11

Source: REFRESH 2019

Table 9: WP 4 Behavioural economics Results - Downloads

WP 4 Document Title + URL	Date upload	Downloads
Socio-Economic Implications of Food Waste: Business Behavioural Typologies and Interrelationships	18 Oct 2016	172
Consumers' Behavioural Economic Interrelationships and Typologies	18 Oct 2016	102
Model Development and Data Protocol	20 Feb 2017	85
Socio-economic implications of food waste: Economics of innovation	7 Aug 2019	70
Model integration - Integrated socio-economic model on food waste	22 Aug 2018	51
Behavioural Economics: Linking Bayesian and agent-based models to assess consumer food waste	11 Jun 2019	24
Behavioural economics: Assessing Food Waste innovations diffusion through Agent Based Models (ABM)	6 Jun 2019	13

Table 10: WP 5 Life cycle costs + assessment Results - Downloads

WP 5 Document Title + URL	Date upload	Downloads
Methodology for evaluating environmental sustainability	24 May 2016	239
Methodology for evaluating LCC	25 May 2016	160
Generic Strategy LCA and LCC	24 Jan 2017	130
Simplified LCA & LCC of food waste valorisation	4 Sep 2018	116
LCA & LCC of food waste case studies	6 Jun 2019	16
Integration of LCC and LCA results to higher system levels	6 Jun 2019	9

Table 11: WP 6 Valorisation Results - Downloads

WP 6 Document Title + URL	Date upload	Downloads
Top 20 Food waste streams	20 Jun 2017	763
Valorisation appropriate waste streams	5 Oct 2016	310
Understanding current management approaches	31 Aug 2018	50
Using steam exploded vegetable side streams as food ingredients	31 Aug 2018	48
Technical Guidelines Animal Feed	4 Jun 2019	39
Annexes - FORKLIFT: Assessing climate impacts and costs of using food side streams	7 Mar 2019	36
FORKLIFT: Assessing climate impacts and costs of using food side streams	7 Mar 2019	35
Valorisation Database: FoodWasteEXplorer	7 Mar 2019	22
Technical Guidelines Animal Feed – Supplementary Materials	4 Jun 2019	16
Technical Guidelines Animal Feed – Literature Review Heat and Inactivation Parameters	4 Jun 2019	12
Technical Guidelines Animal Feed – virus inactivation	4 Jun 2019	10

WP 6 Document Title + URL	Date upload	Downloads
database - Heat		
Technical Guidelines Animal Feed – virus inactivation database - Acid	4 Jun 2019	7
Viability of bio-based chemicals from food waste	16 Jul 2019	4

Source: REFRESH 2019

Table 12: WP 7 Communication Results - Downloads

WP 7 Document Title + URL	Date upload	Downloads
REFRESH Flyer	1 Dec 2016	663
REFRESH Postcard Apple	1 Dec 2016	272
REFRESH Postcard Veggies	1 Dec 2016	256
REFRESH interim Results to 2017 presented in brochure	21 Jun 2017	217
REFRESH interim results to 2018 presented in brochure	1 Aug 2018	147
REFRESH Food Waste Solution Contest Poster	3 Jul 2017	96
REFRESH Community of Experts	4 Oct 2017	5

Source: REFRESH 2019

6.2.5   Webstatistics for REFRESH national platforms

In the following the webstatistics for the REFRESH website section National Platforms (https://eu-refresh.org/national-platforms) is presented.

Until July 2019 the **coordinators of the national platforms have provided ten to fourteen** English articles for their REFRESH website sections (see figure below right bars). Spain's national platform website section is attracting most visitors followed by Germany, The Netherlands, China and Hungary (see figure below left bars).

Figure 9: Number of articles posted and page views on national platform website sections

Number of articles posted and page views on national platform website sections (English)
2016-08 to 2019-07

Page views

Articles posted
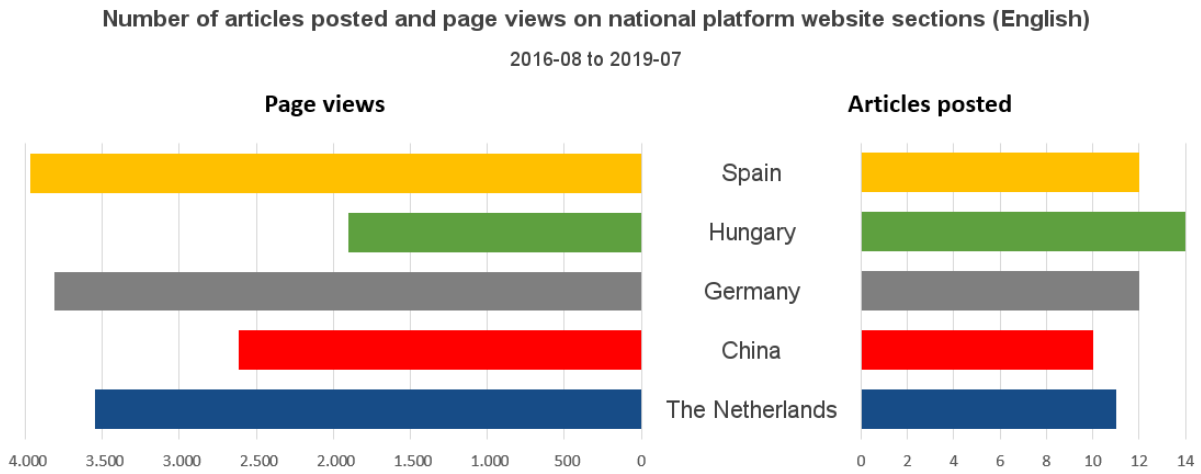
Source: REFRESH 2019

The figure below shows the development of page views of the English national platform website sections over time.

Figure 10: Monthly page views on REFRESH national platform website sections

Monthly page views on REFRESH national platform website sections (English)
2016-08 - 2019-07
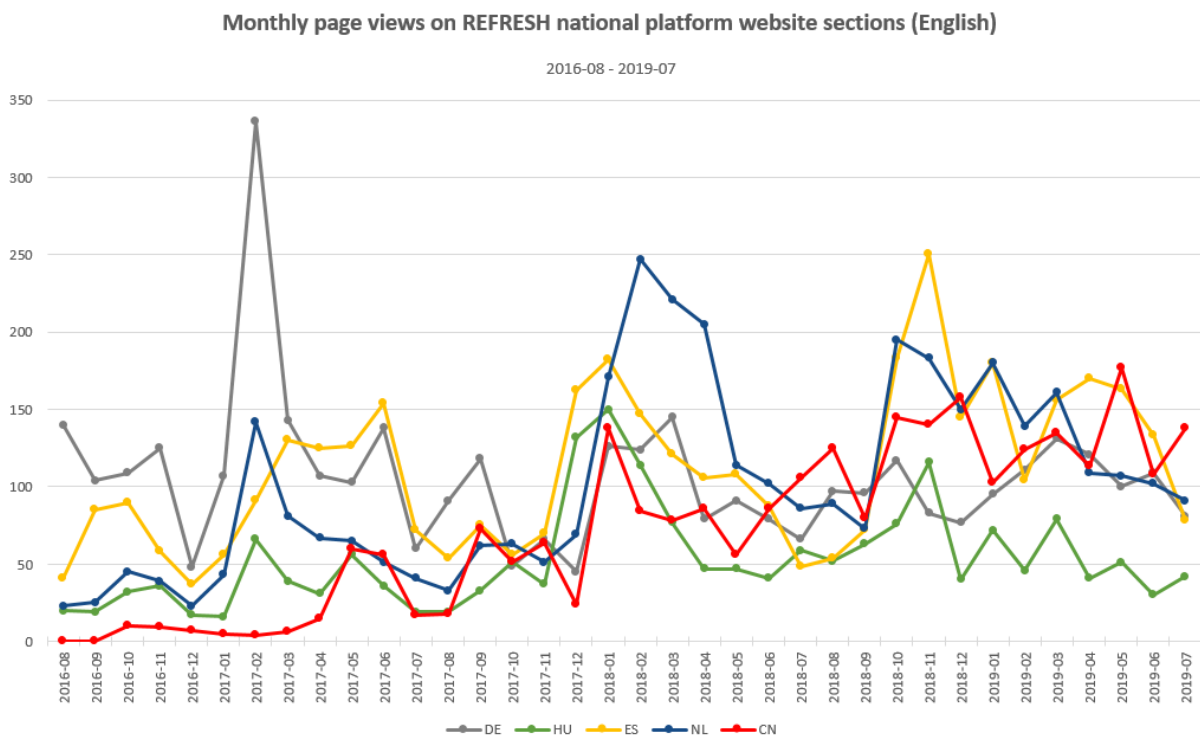
Source: REFRESH 2019

The following figure shows how visitors of the English PWP website sections were acquired. The bigger the dark blue segment in the big pie, the more visitors accessed the national platform website section via direct links. Visitors via direct

links can be seen as an indicator for the respective coordinator's direct dissemination activity, e.g. mailings and newsletters. Compared to the REFRESH website as a whole, the national platform sections were proportionally more often accessed via direct links (see figure 11).

The bigger the light green segment in the left pie is, the more users access the national platform website section via referring websites and social media. For this segment more details are given in the small pie.

The bigger the pink segment in the small pie is, the more visitors access via links on multiplier websites (e.g. of REFRESH partners, national platform members, European Commission, other research projects). The Spanish national platform was most successful in having other websites link to their national platform website section.

The lighter blue, yellow, and dark green segments in the small pie show how many users are referred from Facebook, Twitter and LinkedIn. Here differences between the national platforms are most obvious. For instance, Hungary was most effective in using Facebook whereas China was getting more visitors via LinkedIn.

Figure 11: How visitors accessed the REFRESH national platform website sections

Referrers to REFRESH national platform website section
2016-08 to 2019-07
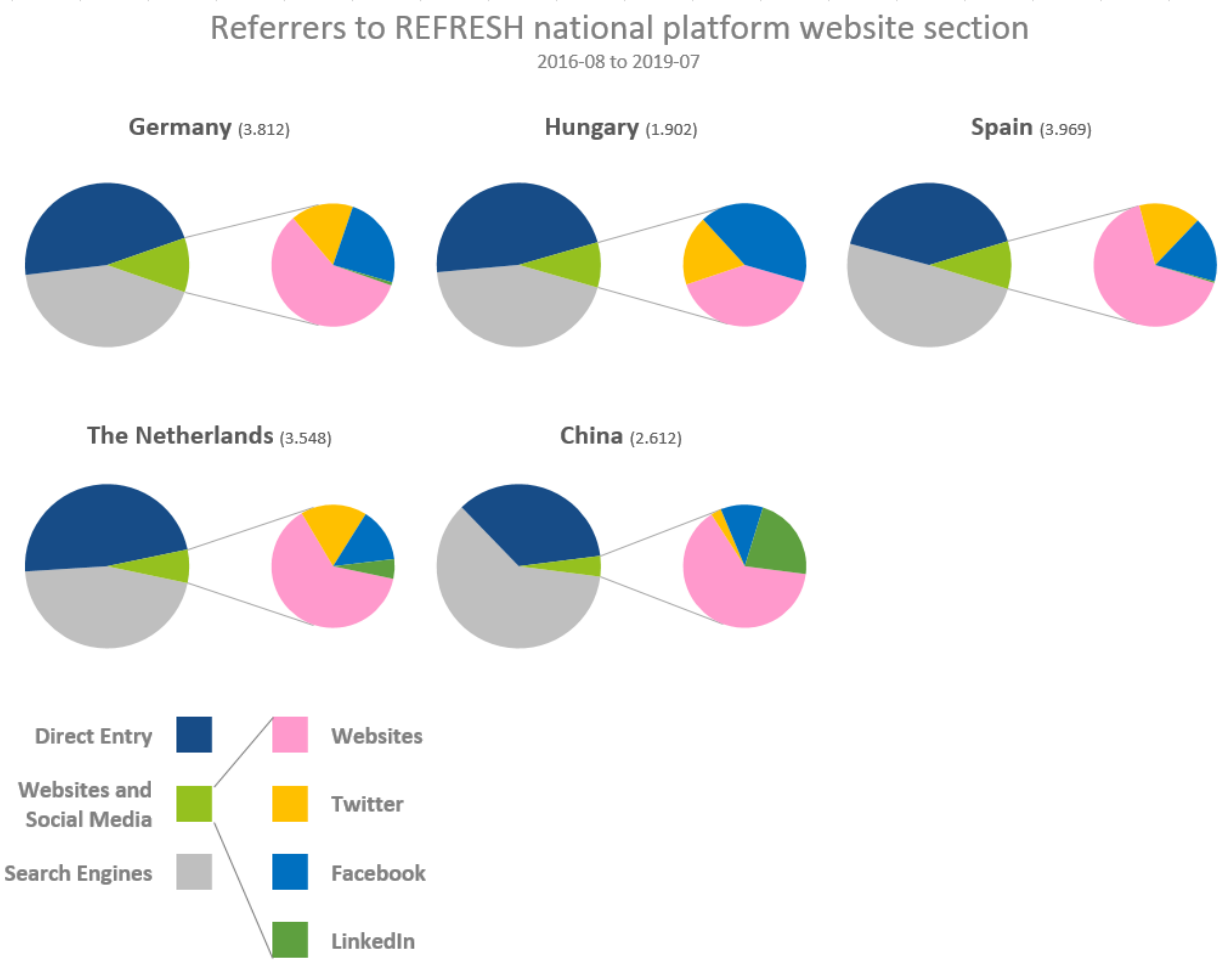
6.2.6   REFRESH visitors' continents

The majority of visitors on eu-refresh.org came from Europe, especially during the REFRESH Food Waste Solution Contest (see chapter 5.1). This indicates that REFRESH reached its mainly European target audience. But the figure below also shows that visits from Asia increased significantly over the three years which is probably caused by increasing activities of the Chinese REFRESH partners (see chapters 6.2.5 and 3.6.5).

Figure 12: REFRESH visitors' continents
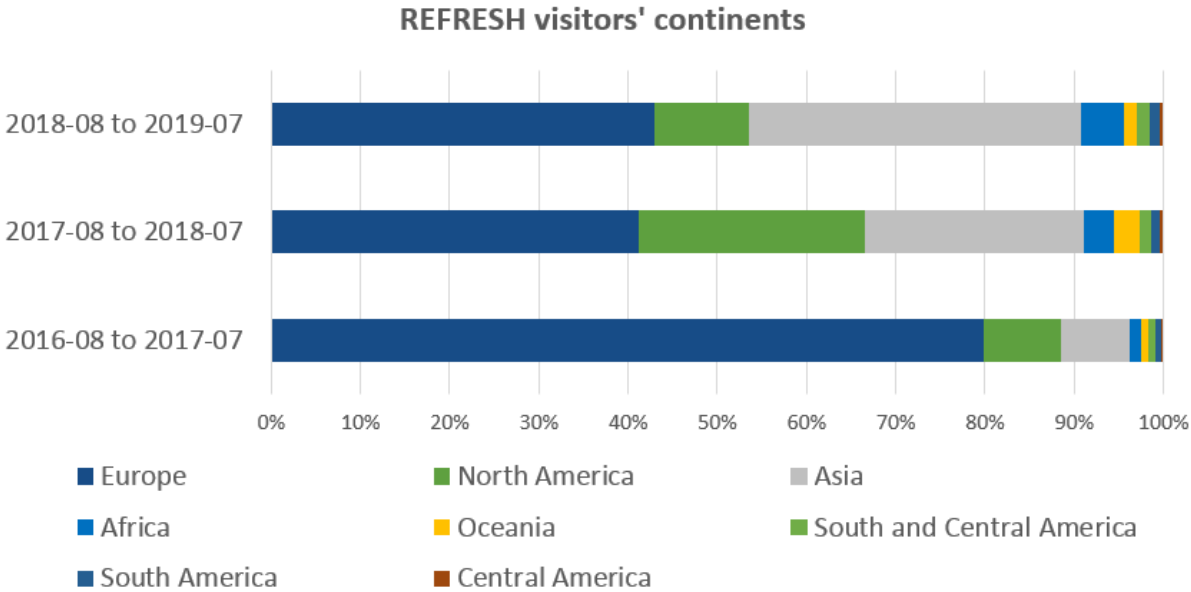
6.2.7   Devices used to visit eu-refresh.org

More than 30% of the website visitors used a smartphone to explore eu-refresh.org. This seems to be a relatively high proportion for a website with scientific content. It might be an **indication for the issue of food waste being of high interest for a broader public**. The figure below shows that in the year of the REFRESH Food Waste Solution Contest (see chapter 5.1) smartphones were even used for more than 50% of the visits.

Figure 13: Devices used to visit eu-refresh.org

Devices used to visit eu-refresh.org

Legend: Desktop, Smartphone, Tablet, Phablet, Other / Unknown
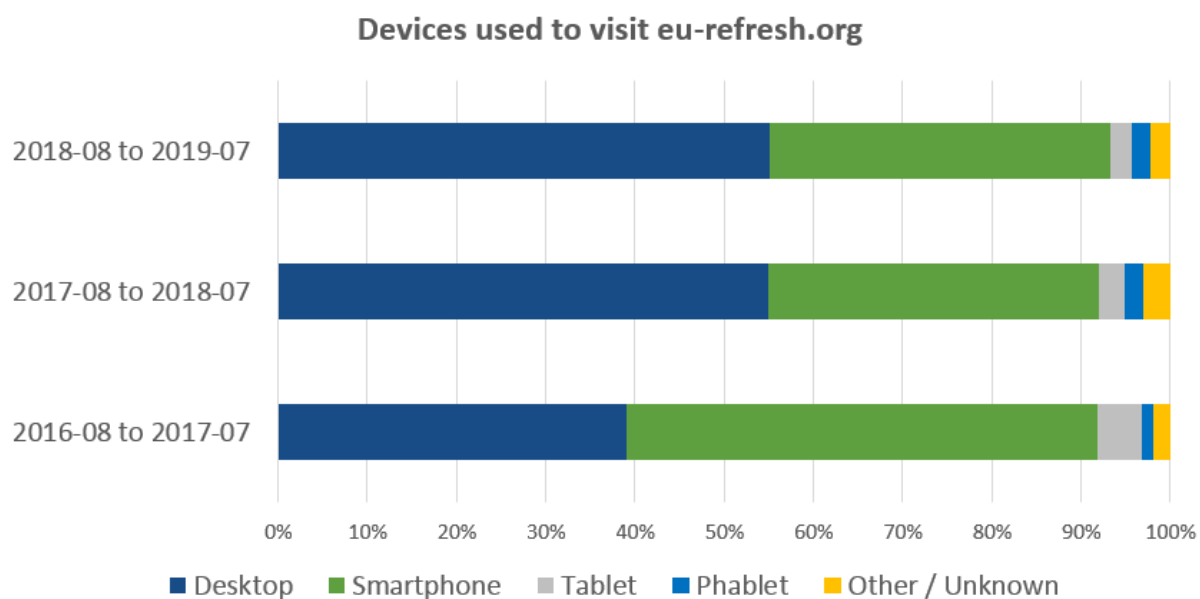
Source: REFRESH 2019

6.3 **Community of Experts**

It has always been clear that the REFRESH communication channels cannot be maintained after the project's end. They will remain online but no further content will be added. Therefore, REFRESH launched an online community of experts (CoE) at refreshcoe.eu on World Food Day 16 October 2017. All REFRESH results are also available via the CoE.

On the REFRESH CoE experts can register as users to share their own research results, tools and innovative approaches, as well as interact with the contributions of other experts. To accelerate and facilitate progress in the food waste area, all experts are encouraged to publish their results in the network and to actively collaborate with the CoE's members. Registered members of the CoE get access to the growing library of resources, support and expertise from other members, and more.

The CoE has been created in **partnership with the EU Platform on Food Losses and Food Waste (FLW)**. The Platform has decided to use the CoE as its main source for new and updated food waste prevention web content. **The Platform will take over the CoE after REFRESH has ended** to continue REFRESH's work in community building and knowledge sharing. In July 2019 the CoE **counted 437 members** (see green line in figure below).

Development of REFRESH online communities
2016-08 to 2019-07
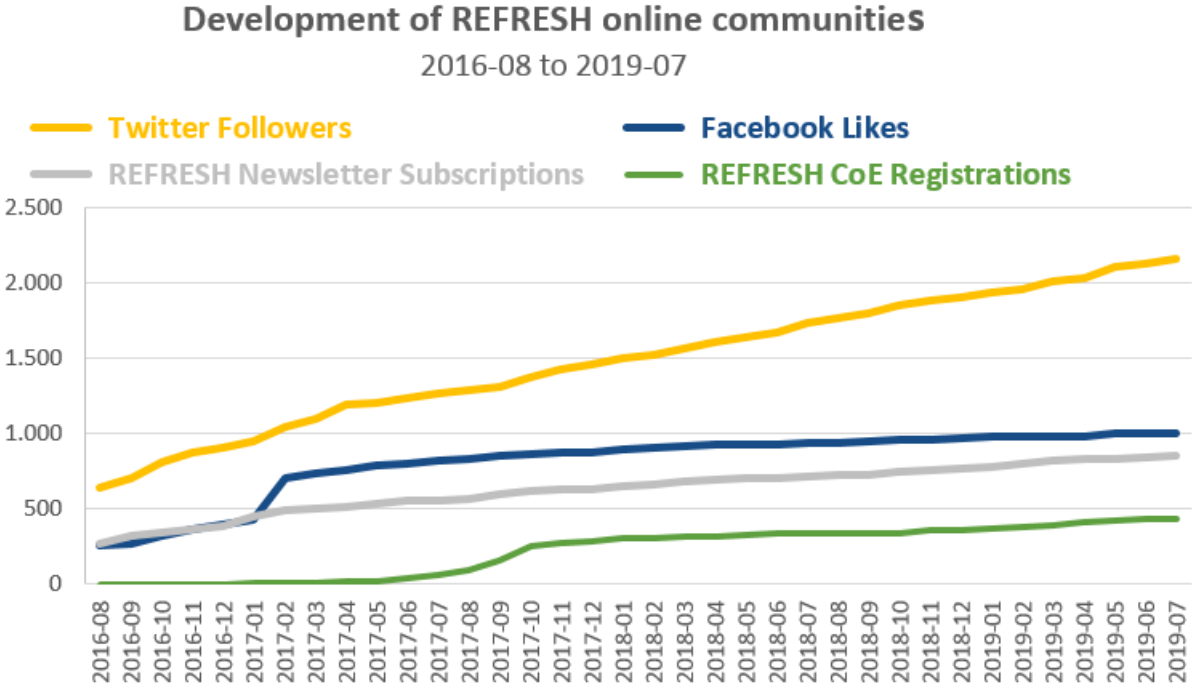
Source: REFRESH 2019

6.4 **REFRESH Newsletter**

The REFRESH **Newsletter counted 851 subscribers** by 31 July 2019. Efforts by all partners to encourage subscription have resulted in a continuous increase of recipients over the four years of the project (see grey line in figure in chapter 6.3).

Six REFRESH Newsletters have been sent out during the project and a final one is planned towards autumn 2019. The following table gives an overview of the dates and numbers of news items of the REFRESH newsletters.

Table 13: REFRESH Newsletters

REFRESH Newsletter	Date	Number of news items
1st Newsletter	March 2016	8
2nd Newsletter	October 2016	15
3rd Newsletter	April 2017	17
4th Newsletter	September 2017	18
5th Newsletter	March 2018	16
6th Newsletter	October 2018	18
7th (final) Newsletter	Planned autumn 2019	

An archive of the REFRESH newsletters is available at: https://eu-refresh.org/newsletter/refresh-newsletter

6.5 Twitter

The REFRESH Twitter account (@EUrefresh) counted **2.165 followers** by 31 July 2019. In terms of community building it is the most successful REFRESH channel (see yellow line in figure in chapter 6.3). REFRESH's follower on Twitter are mainly coming from Europe (see figure below).

Figure 15: Geographical distribution of @EUrefresh Followers
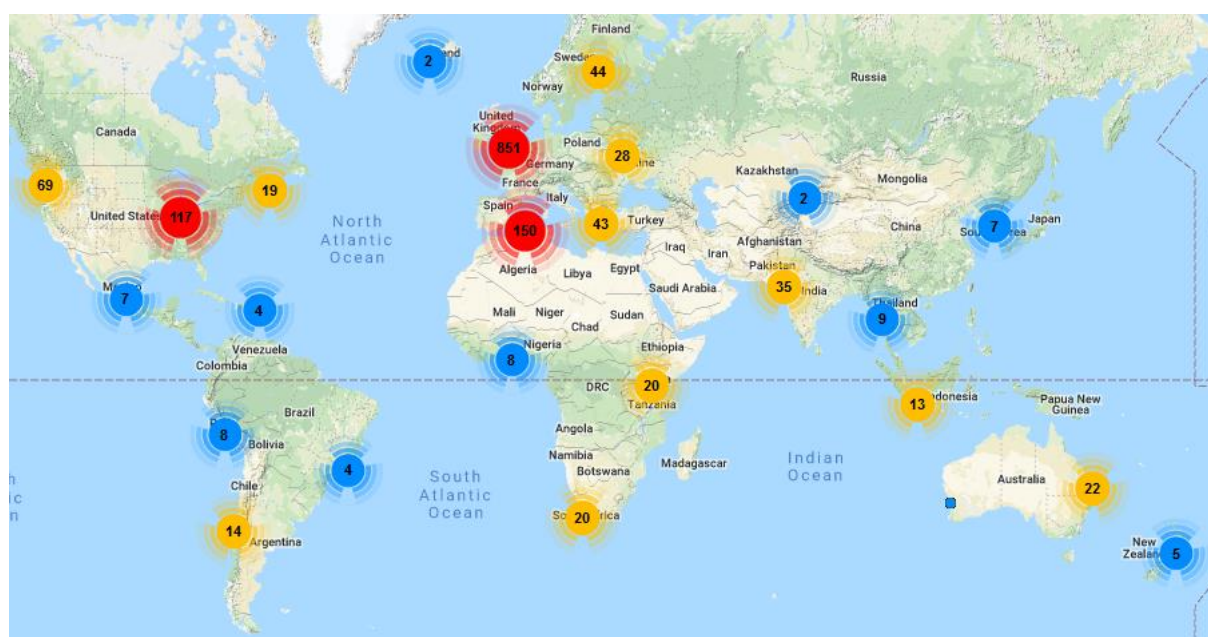
Source: https://followerwonk.com/analyze/eurefresh 2 Aug 2019

In the last three years of the project a total of **763 tweets** has been posted and @EUrefresh has been **mentioned 1.640 times by other Twitter channels** (see figure below). In the same period of time a total of **2.217 visits** on eu-refresh.org were **referred from Twitter** (see figure in chapter 6.6). 741 of these referred visits fall in the public voting period of the REFRESH Food Waste Solution Contest (see chapter 5.1).

Figure 16: Number of Tweets and Mentions @EUrefresh

Number of Tweets and Mentions @EUrefresh
2016-08 to 2019-07

■ Tweets ■ Mentions
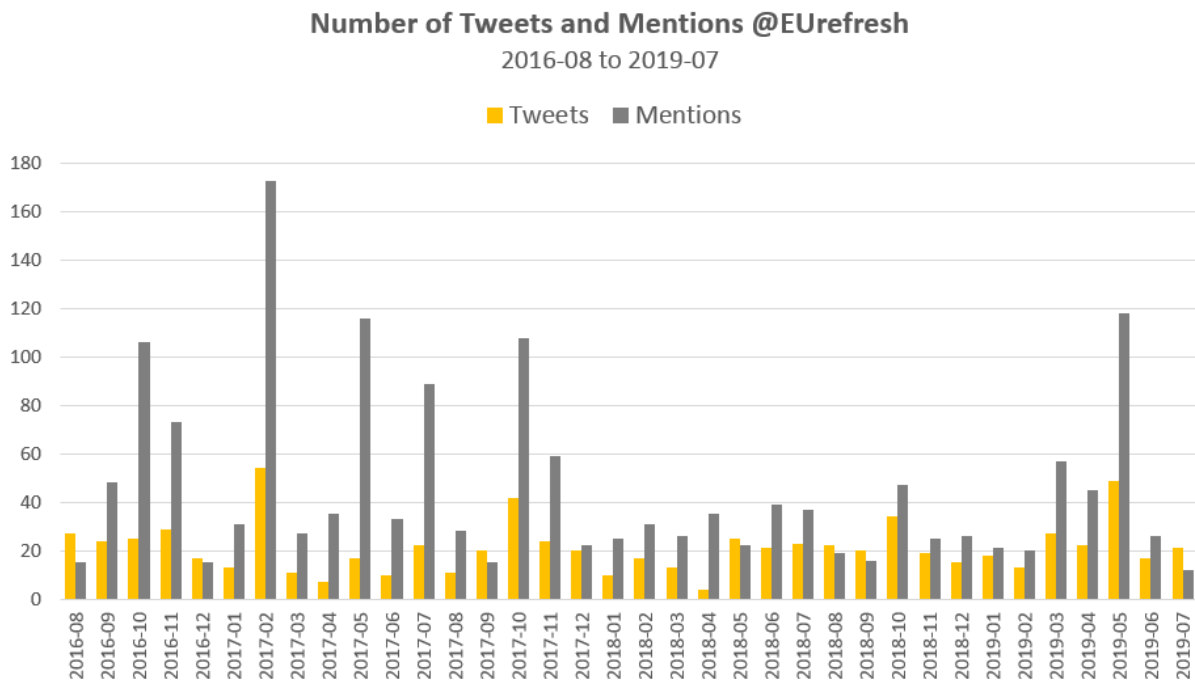
Source: REFRESH 2019

6.6 **Facebook**

On Facebook at facebook.com/eurefresh, the REFRESH page has reached **1001 likes** by 31 July 2019 (see blue line in figure in chapter 6.3). In the last three years of the project a total of 629 posts have been made on Facebook (see figure below).

Figure 17: Number of Posts on Facebook

Number of Posts on Facebook
2016-08 to 2019-07
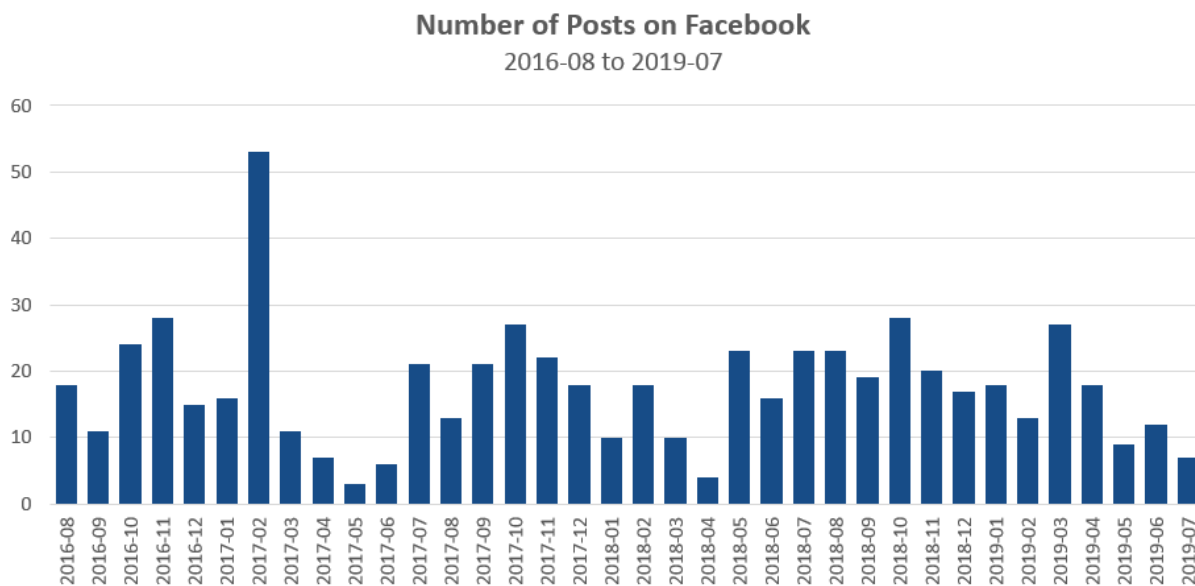
In the last three years of the project a total of **40.161 visits** on <u>eu-refresh.org</u> **were referred from Facebook**. 37.509 referred visits fall in the public voting period of the REFRESH Food Waste Solution Contest (see chapter 5.1).

Figure 18: Website visitors referred from Twitter and Facebook

Website visitors referred to eu-refresh.org from social media
2016-08 to 2019-07

6.7 **Videos / YouTube**

REFRESH's youTube channel is available at <u>https://www.youtube.com/channel/UCxKOF-okk7H5giTzYBsdw3A</u>. The following table shows the videos produced and published by REFRESH, **including four videos** summarising REFRESH results which are still under production.On 31 July 2019 the youTube channel had 47 subscribers.

Table 14: REFRESH videos

Title of Video Link	Date	Views until 31 Jul 2019
Food Waste Innovators wanted! REFRESH Food Waste Solution Contest Call for Submissions <u>https://youtu.be/jqj7uaeMR1s</u>	6 Oct 2016	2.427
REFRESH: Resource Efficient Food and dRink for the Entire Supply cHain	22 Mar 2017	1.613

Title of Video Link	Date	Views until 31 Jul 2019
https://youtu.be/AtZA6nzbBEw		
REFRESH Food Waste 2017 Conference Video https://youtu.be/p2rXgjgpQ04	20 Jun 2017	771
REFRESH webinar: Adding value to food waste and by products https://youtu.be/xkPU_XeM-YE	16 Apr 2019	88
REFRESH webinar: Voluntary agreements to address food waste https://youtu.be/s-IBJEraWYc	16 Apr 2019	69
REFRESH webinar: Tackling consumer food waste https://youtu.be/zaXFbm0SIII	30 Apr 2019	60
REFRESH webinar: Measuring and managing retail food waste https://youtu.be/8vXCv8XX42U	6 May 2019	69
EU Commissioner Andriukaitis - Impacts of research project REFRESH on policy-makers https://youtu.be/J2eat0FOjyo	10 Jul 2019	69
REFRESH results video: Research against food waste	Autumn 2019	
REFRESH results video: Reducing consumer food waste	Autumn 2019	
REFRESH results video: Valorising unavoidable food waste	Autumn 2019	
REFRESH results video: National platforms to fight food waste	Autumn 2019	

Source: REFRESH 2019

A total of **5.436 video views** with 7.216 minutes watch time have been reached in REFRESH's youTube channel in the last three years of the project (Aug 2016 – Jul 2019).

Furthermore, the video submissions of the REFRESH Food Waste Solution Contests (see chapter 5.1) in Europe and China have been assembled in playlists of the channel.

6.8 Press Releases / Direct Mailings

A total of **17 press releases** or direct mass mailings have been sent during the REFRESH project. The following table gives an overview of the mailings, their dates and approx. number of recipients.

Mailings concerning REFRESH as a whole have been sent out by the REFRESH dissemination team from info@eu-refresh.org. For this purpose a **contact database** was assembled at the beginning of the project relying on data from the FUSIONS project and from project partners. Multipliers have continuously been added to the data base in order to activate them for disseminating REFRESH information. In parallel, users were able to subscribe to the REFRESH Newsletter (see chapter 6.4). Since the **General Data Protection Regulation (GDPR)** came into force in May 2018 the REFRESH dissemination team was more reserved on using the contacts of the database.

Some of the press releases were adapted by REFRESH partners and additionally sent out to their institutional networks. Adaptations included for instance translations into local languages or tailoring press releases to local media and audiences by adding quotes from relevant researcher of their institutions.

Table 15: REFRESH Press Releases / Direct Mailings

Title	Date	Number of recipients
REFRESH: New EU-project starts to reduce food waste across Europe – Press Release No 1	14 Sep 2015	>1.000
First Steps to Set up the Framework for Action in Spain (by CREDA)	2 Mar 2016	unknown
Second meeting of the REFRESH project partners (by CREDA/WUR)	7 Sep 2016	unknown
Second meeting of the REFRESH Spanish National Platform	22 Sep 2016	unknown
REFRESH Food Waste Solution Contest launched, submissions open until 30 November – Press Release No 2	11 Oct 2016	1.132
Dutch Taskforce Connects Initiatives Against Food Waste (by WUR)	26 Jan 2017	unknown
REFRESH Conference 2017 & Public Award of the Food Waste Solution Contest – Press Release No 3	1 Feb 2017	1.444
Announcing Food Waste Solution Contest Results	7 March 2017	1.182
Call for participation in REFRESH consumer survey	12 Jul 2017	620
Call for content for Community of Experts	12 Sep 2017	165
Online Community of Experts helps tackle food waste in Europe – Press Release No 4	16 Oct 2017	1.410
The 3rd Meeting of the Spanish REFRESH Platform took place (by CREDA)	23 Nov 2017	unknown

Food Saving Event	20 Mar 2018	26
New survey shows UK pig farmers support lifting the ban on feeding pigs with leftovers, while experts say safety concerns can be overcome	25 Apr 2018	50
Pigs could stop 14 million tonnes of surplus food from being wasted (by Feedback)	21 May 2019	unknown
Press release announcing FoodWasteEXplorer	31 May 2019	55
Planned: Mailing at the end of the project	Autumn 2019	>1.400

Source: REFRESH 2019

90 mentions of REFRESH in other media (newspapers, newsletters, blogs, websites etc.) have been reported. Especially the Food waste solution contest was successful in generating media attention for REFRESH. The table below shows how many mentions of REFRESH in the media were reported by year.

Table 16: Number of reported media mentioning REFRESH

Year	Number of mentions
2015 (Sep – Dec)	14
2016 (Jan- Dec)	15
2017 (Jan- Dec)	37
2018 (Jan- Dec)	18
2019 (Jan- Jul)	6

Source: REFRESH 2019

The following list highlights a small selection of media that mentioned REFRESH. More detailed information can be found in the adjoint Excel file.

- **You Have the Power to End the Global Food Waste Scandal**
  28 Sep 2015
  Huffington Post
  http://www.huffingtonpost.com/selina-juul/you-have-the-power-to-end_b_8193954.html

- **Pigs are the answer to the supermarket food waste crisis**
  9 Nov 2015
  The Times opinion piece
  https://www.thetimes.co.uk/article/pigs-are-the-answer-to-the-supermarket-food-waste-crisis-k95j266pkvm

- **Essen gehört nicht in den Müll**
  19 Dec 2015
  Die Presse

http://diepresse.com/home/science/4890714/Essen-gehort-nicht-in-den-Mull?from=simarchiv

- **Supermarket food waste law comes into place in France**
  5 Feb 2016
  newfoodmagazine
  http://www.newfoodmagazine.com/22253/news/industry-news/supermarket-food-waste-law-comes-into-place-in-france/

- **Keresik az élelmiszermentés legkreatívabb újítóit!**
  14 Nov 2016
  Presztízs magazin
  https://www.presztizs.com/civil-vilag/keresik-az-elelmiszermentes-legkreativabb-ujitoit

- **Food loss and waste: A key issue for our generation**
  1 Apr 2017
  The Institution of Environmental Sciences (IES)
  https://www.the-ies.org/analysis/food-loss-and-waste-key-issue

- **Strategien gegen Lebensmittelverschwendung**
  15 Jun 2017
  Südwestrundfunk
  https://www.swr.de/swr2/wissen/lebensmittel-muell,broadcastcontrib-swr-33406.html

- **The supermarket that sells what others throw away**
  2 Oct 2017
  euronews
  https://www.euronews.com/2017/10/02/the-supermarket-that-sells-what-others-throw-away

- **De las buenas prácticas a la fecha de consumo preferente: un nuevo grupo en línea contra los residuos alimentarios**
  22 Nov 2017
  Cordis European Commission
  https://cordis.europa.eu/news/rcn/128677/es

- **Lebensmittelabfälle als wertvolle Ressource**
  6 Mar 2018
  Südwestrundfunk
  https://www.swr.de/wissen/lebensmittelabfaelle-als-ressource/-/id=253126/did=21286972/nid=253126/1vk2ya4/index.html

- **Food-and-Mouth Ban**
  22.July 2018
  BBC1's Countryfile, 30th Anniversary edition
  https://www.bbc.co.uk/programmes/b0bcr2g8

- **Food waste and circular economies**
  11 Oct 2018
  Ecologist
  https://theecologist.org/2018/oct/11/food-waste-and-circular-economies

- **Stepping up to the plate? Adopting a "circular economy," amid the environmental scandals of food waste**
  8 May 2019
  Food Ingredients First
  https://www.foodingredientsfirst.com/news/Stepping-up-to-the-plate-Adopting-a-circular-economy-amid-the-environmental-scandals-of-food-waste.html

- **Unavoidable surplus food is the ultimate sustainable feed, so let's raise our ambition to find a safe solution**
  31 Jul 2019
  FeedNavigator
  https://www.feednavigator.com/Article/2019/07/31/Unavoidable-surplus-food-is-the-ultimate-sustainable-feed-so-let-s-raise-our-ambition-to-find-a-safe-solution

7 Dissemination activities through partners' channels

REFRESH partners were encouraged to also use their institutional and personal channels to disseminate news about REFRESH. They increasingly responded to dissemination requests by the REFRESH dissemination team. This report gives aggregated data about partners' dissemination activities.

7.1 Posts on partners' websites

A majority of partners reported to have included a total of **157 posts** about REFRESH on their websites. The number of reported REFRESH posts on partners' websites clearly increased towards the end of the project. The following table gives the numbers of websites post reported by year.

Table 17: REFRESH news on partners' websites

Year	Number of posts on partners' websites
2015 (Sep – Dec)	10
2016 (Jan- Dec)	7
2017 (Jan- Dec)	24
2018 (Jan- Dec)	73
2019 (Jan- Jul)	43

Source: REFRESH 2019

The next table shows **how many visitors were referred to eu-refresh.org from top ten partners' websites** within the last three years of the project.

Table 18: Top ten partner websites referring visitors to eu-refresh.org

Partner Website	Number of referred visitors 2016-08 to 2019-07
WRAP - wrap.org.uk	414
Ecologic - ecologic.eu	146
CREDA - creda.es	131
EuroFIR– eurofir.org	65
CSCP – scp-centre.org	63
Feedback - feedbackglobal.org	47
WUR -wur.nl	43
BOKU - wau.boku.ac.at	41
IFR - ifr.ac.uk	35
IVL - ivl.se	32

Source: REFRESH 2019

7.2 News in partners' newsletters

11 partners reported to have included a total of **68 news** about REFRESH in their **institutional newsletters**. The newsletters' reach **ranged in size from 50 to 50.000**. The following table gives an overview on which partners reported how many REFRESH news in their newsletters.

Table 19: REFRESH news in partners' newsletters

Name of Newsletter	Partner	REFRESH news	Sub-scribers
ABF-BOKU Newsletter	BOKU	6	490
Dossier formacio i assessorament al sector agroalimentari	CREDA	1	unknown
CSCP Newsletter	CSCP	5	2.600
FUSIONS Newsletter		1	1.015
Ecologic Newsletter	Ecologic	13	3.035
EuroFIR Newsletter	EuroFIR	9	2.500
Feedback Newsletter	Feedback	5	6.910
HFA Newsletter	HFA	2	50.000
Food Databanks National Capability Newsletter	IFR / QIB	2	880
Newsletter from IVL	IVL	1	5.179

Name of Newsletter	Partner	REFRESH news	Sub-scribers
60 seconds	WRAP	23	200

Source: REFRESH 2019

7.3 Posts in partners' social media

7.3.1 Twitter

Nine partners reported to have used their institutional or personal Twitter accounts to disseminate REFRESH news. In total they **used 25 Twitter accounts** to post 614 REFRESH tweets. Together these 25 Twitter accounts have more than **135.000 followers in 2019**. The table below shows the partners, accounts, numbers of followers and tweets about REFRESH per year.

Table 20: REFRESH news in partners' Twitter accounts

Partner	Twitter Account	Followers	Tweets				
			2015	2016	2017	2018	2019
BOKU	@Nicole_Unger_	5			1		
CREDA	@CREDA-UPC-IRTA	612	0	26	64	11	
CSCP	@scp_centre	1.709	2	10	13	10	20
Deloitte	@DeloitteDD	1.712			2		
Deloitte	@ManuelaGhe	425			2	9	
Deloitte	@s_burgos_	122			2	1	
Deloitte	@Bio_by_Deloitte	439	3				
Ecologic	@EcologicBerlin	7.021		3	8	7	21
Ecologic	@EcologicEvents	597	2	2	0		
Ecologic	@St_Wunder	347				12	16
EuroFIR	@EuroFIR	539	4	10	13	10	11
EuroFIR	@EuroFIRAISBL	545				7	
Feedback	@thepigidea	7.629	28		45	1	1
Feedback	@feedbackorg	12.800			37	3	6
QIB	@NRPBiorefinery	364	7	24	26		
QIB	@FHNinfo	530	4	0	0		
QIB	@NISNutrition	157		2	3	1	

Partner	Twitter	⌐○—		Tweets			
QIB	@IFRScience @TheQuadram	5.164	3	4	8		4
QIB	@FoodDatabanksQI	259				3	4
WRAP	@WRAP_UK	30.600			3	9	8
WRAP	@LFHW_UK	60.500			1	0	
WRAP	@TheBygraves	142				17	38
WRAP	@R_Swannell	1.193				9	9
WRAP	@clairekneller	1.673				6	6
		135.084	**53**	**81**	**228**	**116**	**136**

Source: REFRESH 2019

7.3.2 Facebook

Seven partners reported to have used their **institutional Facebook accounts** to disseminate REFRESH news. In total they used **9 Facebook accounts to post 88 REFRESH news**. Together these 9 Facebook accounts have **more than 50.000 likes in 2019**. The table below shows the partners, accounts, numbers of likes and posts about REFRESH per year.

Table 21: REFRESH news in partners' Facebook accounts

Partner	Facebook Page	Likes	Posts 2015	2016	2017	2018	2019
BOKU	/abfallwirtschaft	663	1	1	1		2
CSCP	/scpcentre	1.478	1	4	3	2	5
Ecologic	/Ecologic.Institute	2.827		2	5		9
EuroFIR	/Eurofir	550	0	1	3	1	
Feedback	/feedbackorg	26.665			7		3
HFA	/elelmiszerbank	13.534	3	9	8	10	5
QIB	/InstituteofFoodResearch /QuadramInstitute	3.026	1		0		
QIB	/FoodDatabanksNC	1.260				3	3
		50.003	**6**	**17**	**27**	**16**	**22**

8 Direct networking

During the whole project REFRESH partners widely interacted with existing groups and networks. REFRESH and selected REFRESH results were presented to different target groups at numerous **conferences and events** (see chapter 8.1). The REFRESH project intensively interacted with the **EU Platform on FLW** (see chapter 8.22) and the FAO.

A good example of the usefulness of using multipliers to disseminate information is the successful cooperation of REFRESH with DG Sante, who have helped advertise the REFRESH project and results in their communication channels. The next table shows how many visitors were referred to eu-refresh.org from top ten multipliers' websites within the last three years of the project.

Table 22: Top ten multiplier websites referring visitors to eu-refresh.org

Multiplier Website	Number of referred visitors 2016-08 to 2019-07
fao.org	421
eu-fusions.org	194
ec.europa.eu	175
naturvardsverket.se	109
linfoantigaspi.com	71
livsmedelsverket.se	65
green-report.ro	61
progettareineuropa.com	60
irta.cat	56
cordis.europa.eu	45

8.1 Presentations at external events

REFRESH partners reported to have represented REFRESH at **173 external events** covering a **broad geographic range** in Europe, North America, and China, and a broad range of stakeholders from business, governments, academia, and civil society. The level of involvement in these external events ranged from networking as a participant to presentations and panel discussions for large audiences. The following table gives an overview of the types of actions of REFRESH partners in external events and an approximate number of participants reached.

Table 23: REFRESH at external events

Type of action	Number of events	Number of participants
Panel discussion	6	1030
Presentation	132	10.814
Workshop	5	270
Poster presentation	16	3.007
Info stand	4	500
Networking	10	9.510
	173	**25.134**

Source: REFRESH 2019

The following list highlights a small selection of events where REFRESH representatives have been active contributors.

- **Final FUSIONS European Platform Meeting**
  19 May 2016 – Brussels
  300 participants
  Stephanie Wunder, Hilke Bos-Brouwers, Toine Timmermans, Karin Ostergren, Manuela Ghedeolus, etc. Presented about REFRESH and distribted REFRESH info material
  http://www.eu-fusions.org/index.php/epm-2016

- **Zero Waste Conference 2016**
  3 November 2016 – Vancouver
  500 participants
  Toine Timmermans presented as speaker.
  http://www.zwc.ca/archive/2016/Pages/default.aspx

- **World Food Convention 2017**
  22 June 2017 – Berlin
  450 participants
  Stephanie Wunder participated in panel discussion.
  https://www.worldfoodconvention.com/2017

- **Harnessing Research and Innovation for FOOD 2030: A science policy dialogue**
  16 October 2017 – Brussels
  810 participants
  Toine Timmermans presented on "Towards a circular economy in food; the role of public-private partnerships" in the Parallel Session "Circularity & Resource Efficiency".
  https://ec.europa.eu/info/events/harnessing-research-and-innovation-food-2030-2017-oct-16_en

- **EURO 2018**
  8-11 July 2018 – Valencia
  2.500 participants
  Marjoleijn Buisman and René Haijema presented on "Donation management for menu planning at soupkitchens"

8.2 Collaboration with the EU Platform on Food Losses and Food Waste

During the entire duration of the project REFRESH intensively interacted with the EU Platform on FLW, which was established by the European Commission.

The EU Platform on FLW aims to support the EU and its member states in contributing to the achievement of the SDG 12.3 to halve per capita food waste at the retail and consumer level by 2030, and reduce food losses along the food production and supply chain. The Platform brings together public entities including Member States, EU bodies and international organisations and actors in the food value chain including consumer – and other NGOs. Several partners of the REFRESH project belong to the core groupf of members of the EU FLWP and have joined all meetings (and some of the subgroup meetings, e.g. on action and implementation).

The FLW supports all actors in:

- defining measures needed to prevent food waste;

- sharing best practice;

- evaluating progress made over time.

Examples of REFRESH contributions at the EU FLWP include the FLW meeting in Vilnius on 24 May 2018[1]. REFRESH coordinator Toine Timmermans (WUR) presented "Towards a circular economy in food: the role of public-private partnerships". REFRESH dissemination lead Stephanie Wunder (Ecologic) facilitated the afternoon session on consumer food waste. During this session, Dr. Erica van Herpen (WUR) presented insights from REFRESH consumer behaviour research on food waste, and David Rogers (WRAP) presented on consumer food waste behaviour change in the UK.

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[1] which can be seen in the videostream of the event at https://youtu.be/98bWOhRqXWc

9 Evaluation of Impact of REFRESH's communication activites: examples

The chapters above have described REFRESH's key communication activities, their outreach, relation to the REFRESH work program and how these activities have contributed to reaching REFRESH's target groups. The following chapter **highlights some of the key impacts** structured along REFRESH's communication and dissemination objectives (see chapter 2.1), which were:

- **Facilitate knowledge exchange** and ongoing mutual learning between different stakeholders and between different regions.

- **Raise awareness** among food chain stakeholders, policy makers and the wider public on the economic, environmental and social impact of food waste, opportunities for its prevention, and the benefits of reducing food waste.

- **Involve relevant stakeholders in the development and implementation of strategies against food waste** undertaken within REFRESH, and ensure that the findings of the project will be taken up by the relevant stakeholders.

- **Share best practice** across the EU28, third countries (incl. China) and internationally and improve opportunities for implementation.

- **Showcase the impacts and outcomes of the project's research and innovation activities.**

- Maximise the availability, accessibility and awareness of the results and learnings from the project to **maximise its ongoing impact and legacy**.

All activities described in chapter 2-8 have contributed to at least one of these objectives. In **most cases communication activities have even achieved several objectives at once**. In order to provide a brief illustration without duplications, however, the overview below just highlights some achievement and gives only few examples per category.

The success of the projects dissemination and communication activities can also be underlined by some of the **quotes received from stakeholders** that have been interviewed for the final REFRESH result video, including the EU Commissioner. They are mentioned below.

9.1 Facilitate knowledge exchange between different stakeholders and between different regions

During the whole project REFRESH partners widely interacted with existing groups and networks. REFRESH and selected REFRESH results were presented to different target groups at numerous events, via social media, through publications etc.

Events and workshops played a particularly important role (see chapter 3). Overall, REFRESH organised 55 events in eight countries (including China). In total, **approximately 4.000 participants attended the REFRESH events**. The evaluation of feedback from participants showed that REFRESH workshops and conferences were **valued for their innovative approach**, **interactive elements and good atmosphere** (facilitating informal networking and interaction through speeddating, excursions and participative group working phases, including art, design, live pigs, disco chop, food waste beer, photo props etc. to communicate results) as well as for their **high quality of research results** that were presented and summarised tailored to the **needs of scientific and practice stakeholders**. It also broadened the reach to interested Member States that wanted to test and implement REFRESH results. During the entire duration of the project REFRESH also intensively **interacted with the EU Platform on FLW**, which was established by the European Commission.

Quote EU Commissioner for Health & Food Safety Vytenis Andriukaitis: "REFRESH's workshops and conferences complemented this cooperative way of building solutions by providing innovative and interactive ways of deepening networks across all levels of society. The power of such multi-layered cooperation must not be underestimated.

Quote Gyula Kasza, of the Hungarian National Food Chain Safety Office about the Hungarian Pilot Working Platform: "One of the biggest learning of the forums work, that you can't do this alone. You definitely need all the stakeholders, sitting next to your table. In fields of food waste prevention we need the NGOs with the endeavor to change, we need the government that can create a framework to change, we need the companies that have the power to change, we need science that can design and measure the change, and definitely, we need the education to constantly fuel the change. … It was a process, because we have the Food Bank Association as a partner in this project and they were well-known and respected actor in the society, either before the REFRESH project."

9.2 Involve relevant stakeholders in the development and implementation of strategies against food waste

Research conducted within REFRESH has identified food waste drivers as cross-cutting by nature. Further studies highlighted the relevance of multi-stakeholder collaboration. In light of these findings, Voluntary Agreements and multi-stakeholder collaboration have been identified as key policy approaches to address the issue of food waste throughout food supply chains.

In 2016 **REFRESH national pilot working platforms for Voluntary Agreements (VAs)** to reduce food waste have been established in Germany, The Netherlands, Hungary, Spain and China. They shared food waste reduction challenges and practices and increasingly reported about their meetings, outputs and pilot activities. Experiences from all national platforms were distilled into a **Blueprint** that provides a step-by-step overview on how Member States can successfully set up and conduct VAs on food waste reduction.

The draft Blueprint was presented to delegates from EU Member States at a Policy workshop on VAs in June 2018. As part of this session, the REFRESH team were able to **offer a free VA Workshop** to up to five Member States, who were seriously considering taking this approach to address food waste within their country. **Interest was received** from;

- Croatia
- Italy
- Belgium (Flanders)
- Sweden
- Denmark
- Slovenia
- Germany
- Greece

As of June 2019 four VA Workshops had been succesfully held with the following Member States

- Sweden (December 2018)
- Germany (February 2019)
- Belgium (June 2019)
- Denmark (June 2019)

The other interested MS were either unable to commit resources to host a workshop prior to the end of the REFRESH project, or were still mid-discussions about the food waste strategy and whether the VA approach was right for them. The great uptake of consulation and mentoring provided by WRAP to set up voluntary agreements is **one of the biggest impacts by REFRESH**, facilitated also through REFRESH'c communication approach.

Quote Danielle Kretz, Team Coordinator for 'Sustainable Food' of the Dutch Ministry of Agriculture, Nature and Food: *"We benefitted a lot from it, because REFRESH was in fact a driving force, for the coalition that we have in the Netherlands 'United against the food waste'. It's a national platform, that brings together all kinds of stakeholders in our country to work on combatting food waste."*

Quote EU Commissioner for Health & Food Safety Vytenis Andriukaitis: *"What I admire about REFRESH is that it has met the challenges with concrete actions and real solutions" (…) "The national pilot working platforms for example is an excellent blueprint for Member States to set up food waste prevention programmes that are effective, by developing voluntary agreements and harnessing the power of public private collaboration."*

9.3 Raise awareness on the economic, environmental and social impact of food waste

Awareness on the economic, environmental and social impacts of food waste was raised through **most of the project activities**. What stands out particularly were the situations, when people and institutions were approached, that have not yet or hardly been involved with food waste reduction, as through the **pilot projects** of the National Platforms in the Netherlands, Germany, Spain and Hungary, that for example reached apprentices at a German retailer, different employees involved in the quantification efforts at a large catering service in Spain or collaboration with industry and restaurants in China.

As an example: after the more than 800 apprentices at the German retailer PENNY learned about how to reduce food waste 50% believed that it had sharpened their awareness of the topic. And indeed, the review survey showed that 80% of trainees discussed the topic with others even months after the training; 25% of them in the family, 23% with other trainees and colleagues and 18% with friends. 42% of trainees felt that what they learned during the training helped them to behave more sustainably in everyday life and at work, and as many as 12% developed their own ideas to reduce food waste. 97% of trainees would even recommend the training courses to others[2].

Quote from Mirka Stark, retailer Penny in Germany, Pilot in the German National Platform: "We developed a training programme for our apprentices and this was very helpful for me inside the company to raise awareness about the topic food waste, of course. And, well, we always did a lot of activities in context of food waste the last years. But still being part of REFRESH helped to raise the awareness even more inside the company. … As I told you, the implementation of the pilot project in our company was very helpful, because of course, I was talking to the board of directors about it and it had to raise the awareness on the different hierarchy level that we have insight our company. That was very helpful."

Quote from Mr. Bernat Aracil, Gastrofira, Pilot in the Spanish National Platform: "For us the main change, the main thing that we saw was the how important it is to quantificate the impact of the leftovers. So, that's for me what's the main thing. We already know that we have food that is not profit, that is a leftover, but we did never have the quantity. So we start to work and think a lot how much food we are throwing away, moving to another place. For me the main thing was to quantificate how much food we waste. … Well inside, what we learn is that we have to take out numbers. I mean, we have to, all the company has to talk out the same. I mean our sales department, our processing department, our … department has to know, how much food we are moving, how much food we are preparing, and also how much food the guest is going to suspect, So that's the main thing we did learn, to make numbers, to quantify how much food we are running. That's something we have inside, we have a programme, that takes

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[2] https://eu-refresh.org/food-waste-reduction-training-penny-apprentices-successfully-completed

control of our food, how much we sell, how much we buy, so that's the main thing we did learn, to talk about numbers, not about sensations or opinions."

Gao Si, IVL about REFRESH in China: *"So far, the REFRESH actions in China have been triggering, engaging a lot of participants. We have raised awareness and some of them are changing behaviors. We can see that happening, so that is the change we see."*

9.4 Share best practice

Similarly to the objective of "Raising awareness", most communication activities (e.g. national platform meetings, policy briefs, workshops etc.) served the obverall goal of sharing best practice. A particular impact to share best practice could be achieved through the **Food Waste Solution Contest** that was started in November 2016. The Food Waste Solution Contest was an unconventional and innovative tool to engage stakeholders with the REFRESH project, share best practice and trigger networking. Through the Contest, REFRESH was able to bring hundreds of stakeholders and thousands of individuals into contact with best practice ideas how to reduce food waste.

Also, the exchange with food waste reduction efforts between China and the EU was very fruitful for both sides, as the following quote illustrates.

Gao Si, IVL about REFRESH in China: *"For some… of the basic methodology that we can definitely learn from REFRESH and from Europe and for some of the campaigns and how you organise things, that is definitely something, we can learn. But what's different is the culture, the habits and something you have and we don't have, like this labeling, double-labeling, it's not a common thing in China."*

9.5 Showcase the impacts and outcomes of the project's research and innovation activities

The broad range of research but also communication activities within REFRESH led to many opportunities to showcase the impacts and outcomes of the project. Examples, as illustrated through the quotes below include REFRESH's work in analyzing the option to (re-)allow catering waste as pig feed, analysis and policy recommendations to change consumer behaviour as well as proviing input to the EU Food Loss and Waste Platform.

Karen Luyckx, Feedback Global, working on the question how to reuse surplus food: *"When we started this work with Refresh, and this is what has been really exciting, the first conversations I had with stakeholders from the feed industry, from the pig industry and policy makers. They all said, "No way, this is too dangerous, we don't know anything about this". By that we evolved the research and that we spoke to experts and we demonstrated how it can be done slowly so more and more of the stakeholders frmo pig & feed industry, from different government started engaging with us and looking for the solution. We've got a really good dialogue now where this differennt stakeholders think that it can be done safely, including veterinarians and other important stakeholders. … Before Refresh started, we tried to have some dialogue with stakeholders. And*

the different stakeholders from the pig industry, feed industry, policy makers didn't want to engage, because they thought it was just too dangerous to consider even in this kind of proposal. But thanks to Refresh, we've been able to bring together these important experts, the veterinarians, the feed and food microbiologists and so on. And thanks to this dialogue and their input, we managed to bring these stakeholders around a table again and they realised that there is a way to do it safely and that there are many benefits. … From this dialogue, we actually started to build alliances with certain feed/food companies and certain pig farmers. The ones, that are really forward looking and realise that things need to change in the industry and that the industry does need to become more sustainable. And together with these allies and right researchers and governmental authorities, we set up alliance to create a pilot design of a treatment plant and work out on all the further details, building on all the details and recommendations that we have created thanks to the research with Refresh."

Anne-Laure Gassin, DG Sante *"The key deliverables from REFRESH are building blocks and tools that will be useful to the European Commission, to national authorities and member states and importantly to all actors in the food value chain including consumers. This are insights as to the drivers of food waste in particular food waste at the consumer level, so that we can learn from these insights, not repeat mistakes, know what works might work less, and build effective programmes."*

Danielle Kretz, Team Coordinator for 'Sustainable Food' of the Dutch Ministry of Agriculture, Nature and Food: *The work that REFRESH did on the consumer behavior was very interesting and very meaningful to us. We learned a lot about that and actually we took that knowledge and implemented that in our new campaign. So that was like spot on and very useful.*

EU Commissioner for Health & Food Safety Vytenis Andriukaitis: "*The extensive research performed by REFRESH has been critical in helping us understand complex questions such as what drives food waste at both a consumer and business level. These insights where not only used to inform discussions at the European Union Food Loss and Waste Platforms for example, but will continue to guide European Union policies on Food Waste reduction in the future."*

9.6   Maximise the availability of the results to maximise its ongoing impact and legacy

The backbone of the project to maximize the availability of results during the project time was the **REFRESH website** (see chapter 6.2). However, it has always been clear that the REFRESH communication channels, including the website cannot be maintained after the project's end.

In order to continue to provide an information hub about food loss and food waste, REFRESH launched an online **community of experts (CoE)** at refreshcoe.eu in 2017 (see chapter 6.3). The CoE has been created in **partnership with the EU Platform on Food Losses and Food Waste (FLW)**. The Platform will take over the CoE after REFRESH has ended to continue REFRESH's work in community building and knowledge sharing.

Moreover, **two decision support systems** (see chapter 4.4) developed by REFRESH (Voluntary Agreements Blueprint and the FoodWasteEXplorer Database) **will remain online and will be maintained and updated** after the lifetime of the project through the involved partners.

Finally yet importantly, the 9 published and 12 planned **academic journal articles** ensure that the legacy of REFRESH will continue to influence international research about food waste.

10   Lessons learned

The following chapter provides an overview of the key success factors with regard to REFRESH's communication and dissemination activities. It also points out barriers that were faced within the project and lessons learned for further improvements, that might be relevant for ongoing or upcoming EU projects and for the EU Commission with regard to the set up and design of supportive communication frameworks in future projects.

The overview builds on a review of the feedback received throughout the project, such as REFRESH events evaluation questionnaires, feedback loops with innovators after the REFRESH contest, conversations with project partners, internal reflections etc.

Conclusions can be made along four different categories:

1. Shared responsibilities with clear lead and guidance

2. Role of network building, relationship establishment and REFRESH events

3. Influence of specific communication tools

4. Project approach and consortium

10.1 Shared responsibilities with clear lead and guidance

The allocation of responsibilities turned out to be a success factor: **all partners were involved** and had allocated resources for communication and dissemination activities. At the same time there was **strong coordination** by the lead partner (Ecologic Institute), **providing the necessary framework** (dissemination strategy, website, templates, training, feedback on deliverables and online summaries etc.) and a **good collaboration with the management lead** (WUR) that further facilitated the identification of appropriate communication activities (relevant external events, publications, research activities, windows of opportunity) for the different project outputs and supported a coherent communication approach within the project consortium.

Capacity building for successful communication **with all partners started with the first meeting** and has been done throughout the whole project. Determining target groups and presumable categories of key results from the beginning helped to sensitize partners. A "key message training" with a journalist

and all work package leads toward the end of the project helped further to improve communication.

Concrete suggestions and support in the dissemination work have proved to be very beneficial. Providing concrete guidelines, templates and pre-formulated tweets and other social media messages, suggested events and communication channels made it easy for partners to spread the project messages to the right audiences. Good experiences have been made with **creating own images and pictures** for communication in line with the corporate design, that were made available for the whole team. This was needed because not only bought images cannot be shared in their use but also since appropriate food loss and waste images are hardly available at the market and vary in style.

Interim evaluations of the dissemination strategy as well as feedback forms for REFRESH events, evaluation of social media output etc. helped to improve and **adapt the communication strategy**. The interim evaluations contained collected data of all partners about the kind of communication and knowledge transfer used and their outreach.

However, despite the support through a harmonized communication framework and strategy, including training and feedback elements, the **activities and outreach varied significantly** between partners, with some contributing very actively and others very rarely. To some extent this can be explained by differing prior knowledge and experience in public dissemination, e.g. that many academic partners have significant experience in publishing results in peer reviewed journals but less experience in presenting results in a more journalistic style to the media but also due to lack of (additional) funds available for communication work. The different level of involvement by communication partners may though also have **influenced the level of visibility of some project results**. A final evaluation is hard to make, as the reporting of dissemination activities by the partners was most likely incomplete. It needs to be reconsidered, if the Excel files provided to gather data were not the optimal instrument to collect and evaluate communication activities. Comparative web statistics on the other hand have motivated partners to provide more web content.

These differences could be partly counterbalanced by a continued, professional communication work in WP7, especially through the professional web and events team of Ecologic Institute. They assured that the **website was continuously adjusted**, kept up to date, designed user-friendly, **summarized all project results in a user friendly way** and centrally promoted project events.

Additional elements of the communication strategy that were added later to the communication plans, such as photos, videos, animations and a quiz were created by the communication lead **without outsourcing tasks** (except for the Community of Experts website). This enabled close coordination, use of corporate design elements and short-term changes. By that, communication activities were managed more efficient and flexible than by hiring a subcontractor.

It also proved beneficial for the quality of dissemination activities and reviews of reports and online summaries, presentation at conferences etc. that the **communication partner was also strongly involved with the content** and

policy work within REFRESH and had therefore a better understanding of the results and their potential for outreach activities.

10.2 Role of network building, relationship establishment and REFRESH events

A focus of REFRESH was to connect to relevant stakeholders very early in the projects and build trust and relations over time. In order to do this, the team was not only open for collaboration with others, but **actively invested time to reach out to the key decision makers** that that might not be aware of the project otherwise, such as veterinarians, retailers, national policy makers, famer associations and others.

Most importantly, throughout the project, close **cooperation was maintained with the European Commission (DG Sante)** and the **EU Platform on Food Loss and Waste**. Thus, **results could be incorporated directly into important European processes**; contacts to other DGs and actors could be made and helped the project team to stay well informed and able to identify political windows of opportunity easily.

In addition, the dissemination work benefitted from this cooperation. Both, DG Sante and the EU Commissioner Vytenis Andriukaitis have spread REFRESH posts on Twitter, which **has generated a lot of public attention** for the project. Moreover, **DG Sante will take over the Community of Experts website that was created by REFRESH** so that the website can continue to serve as an information hub even after the lifetime of the project – an outcome that can usually rarely be achieved after the lifetime of a project.

The **number and quality of events and workshops** that REFRESH organized **helped significantly to build and strengthen networks**, review and further improve draft results and to discuss critical issues with the relevant stakeholders and decision makers. The project tested and implemented **experimental, creative and interactive formats** that foster relationship building (such as the inclusion of interactive parts and small informal group work in event agendas, speed dating opportunities, the Incubator Day with mentoring, the Food Waste Solution Contest with jury and public vote, involvement of artists in the events etc.) and put a focus on informal and entertaining elements that helped to **provide a good working atmosphere** and allowed people to connect to each other. Examples include chopping discos, content-related excursions, fun communication elements like ugly protesting vegetables, appearing in the project video, on the website and interactive art elements.

A **difficulty faced** within the workshop and events organization was the **General Data Protection Regulation (GDPR)** that came into force in 2018, as data protection regulation **makes it almost impossible to build up a topic specific database of contacts**: Sharing mailing lists amongst partners is prohibited and a continuous use of relevant contacts even after the project would require to ask everyone for permission, which means huge additional effort.

To create coherent messages ("walk the talk") and confidence in the ambition and aspiration of the project **REFRESHs event catering was always in alignment**

with ideas and targets of the project. As far as possible, the caterer used rescued food, regionally, fairly and organically produced ingredients, served vegetarian meals and avoided leftovers and packaging waste. Often, social start-ups have been integrated.

However, it needs to be noted that this approach of managing the project with an emphasis on the establishment of relationships and the maintenance of networks is **very time-consuming and more cost-intensive. It is however a prerequisite to exploit the full project impact potential**. Especially in the organization of events, it requires a lot of preparation time to identify, directly contact and often convince relevant stakeholders and decision makers to come and contribute and to align the different inputs that are needed for a coherent workshop message. This time is often not invested in research projects, particularly when it comes to reaching out beyond the research community. The project team also **shared draft research results with key practice partners and decision makers** and allowed for comments and suggestions. This extra effort is also not common practice in EU research projects, requires additional time and effort but **significantly increases the visibility, quality and usability of project results**.

10.3 Influence of specific communication tools

It is in the nature of long-term research projects, that in the beginning they have no results yet to communicate. In order to start communication about the project, the project team looked into ways how to make the food waste community aware of the project, engage them in the network and to profit from their ideas. In this regard, the decision - or rather experiment - to start the project with the **Food Waste Solution Contest was a very good decision**. Looking back the four years of the project, the contest with its **public voting can be seen as the most important tool to make the project visible to the network and wider public** and gaining attention of interested stakeholder right from the start, with relatively low costs, compared to e.g. conferences.

To attract more visitors to the website in the beginning of the project, the website also **provided an overview of food waste related external events**. This was gradually replaced by REFRESH's own activities and results.

In addition, **social media** has proven to be a useful tool to maintain the online day-to-day presence of the project, to interact with diverse stakeholders about REFRESH activities, and stay abreast of the relevant developments in the community. It is unfortunate however, that the **social media channels** that have been built up with a lot of effort and many hundred followers (e.g. more than 2.200 on Twitter) **cannot be used and maintained after the end of the project**. This is also true for the REFRESH **website**, which will not be maintained after the project ends.

The decision against project **flyers** with a project description that often are quickly outdated but in favor of REFRESH printed postcards turned out to be a good decision. **REFRESH Press Releases**, however could **not** become **an**

effective and suitable instrument. **Info mailings** and newsletters seemed to be more effective and appropriate to the target group.

Last but not least: The high number of visits of the REFRESH website and social media followers is partly also due to the fact that **food waste is a topic** of high public relevance and has **received increasing media attention** since 2015. The website with its appealing design and easily accessible up-to-date information was therefore an attractive central point for information.

10.4 Project approach and consortium

To address the complexity of food waste problems and solutions the **broad scope of the project** as defined in the "Description of Action" (DOA) turned out to be beneficial as it **included also some flexibility in the tasks undertaken**. This in turn was helpful in the project, as new issues on the scientific and political agenda could be included in the scope of the work, as illustrated with the two examples below:

- Example 1: When actors showed interest in building up Voluntary Agreements in their countries, WRAP offered support by mentoring and compiled the blueprint on voluntary approaches to cutting food waste well ahead the deadline set in the DOA. In this way, mentoring discussion could directly be used as feedback on the blueprint. Most importantly it was **beneficial to the users, as the approach adapted to their needs: time wise and content wise**.

- Example 2: While it was clear that policy briefs will be developed in the project, it was not yet predefined in which area. This allowed the team to respond to the EU debate on "Unfair Trading Practices" that only came up during 2018. It allowed the team to write a policy brief that became influential in the public debate.

The flexibility to respond to requirements and needs stakeholders face in practice helped the communication with stakeholders as they could frequently see that REFRESH was not only developing high quality research but also showed ability and flexibility to provide guidance how to make best use of these results.

The fact, that the **consortium** did not only include researchers but also other institutions, that frequently work with **stakeholders from the food supply chain and EU policy** even before and after the project helped to ensure that the right format and language was chosen to reach these actors and ensured a continued use and application of project results. For example, partners have hosted REFRESH results on their websites (Voluntary Action blueprint, FoodWasteExplorer, Animal Feed Tool) and will maintain them, thereby facilitating their long-term use even more.

The project approach, engagement of partners, an ambitious but flexible DOA and good networks enabled that the project results **often covered topics that have not been addressed by science and in practice** (also due to the time lag that usually lies between political attention, project tendering and the beginning of the project).