

Vanguard Initiative – Bioeconomy Pilot

Action Plan implementation report 2018

Goal: assess the pilot/demo developments in 2018 on the basis of the approved 2018 Action Plan (AP18)

Please find herewith the activities foreseen by the 2018 Action Plan, broken down by Pilot and Demo levels.

Note:

- **Action planned:** description of what was planned in the AP18
- **Time:** time frame for the action implementation
- **Accomplished (Y/N):** the task has been accomplished yes or no?
- **Short presentation:** if yes, short description of the actions, activities, results, partners
- **Corrective action:** if no, short description of the reasons why and the corrective action(s) taken (e.g. cancelled, postponed...) with explanation
- **Annex:** any annex (e.g. report, plan, proposal...) that is part of the action

1. Pilot

Action planned	Time	Accomplished (Y/N)	Short presentation	Corrective action	Annex
Improve overall management: <ul style="list-style-type: none">• Greater involvement of Steering group members	Q1-Q4	Y	<ul style="list-style-type: none">• The calendar of the Steering Group meetings is respected; every meeting is anticipated by discussion documents and followed by a Meeting Report (in annex); The Steering has been enlarged from its original members to include co-		<ul style="list-style-type: none">• Steering group meeting calendar, member list and reports

<ul style="list-style-type: none"> • Close checking of strategic and operative planning documents • Careful monitoring of quantitative indicators 		<p>Y</p> <p>Y</p>	<p>leaders of the demo cases for greater representativeness; the Steering is regularly involved in strategic decisions (e.g. identification, selection and contract definition with the external consultant)</p> <ul style="list-style-type: none"> • AP18 is the reference document for both implementing and reporting the pilot/demo actions in 2018 • KPIs are reported in the proper Report section 		
<p>Stimulate new demo cases</p> <ul style="list-style-type: none"> • Production of information material on the Pilot • Direct contact with VI regions to identify Bioeconomy Points of Contacts 	<p>Q1</p> <p>Q1</p>	<p>N</p> <p>Y</p>	<ul style="list-style-type: none"> • All member regions have been contacted since March, with a recall in April, in order to get feedback on interest in the Pilot and contacts for Vanguard/bioeconomy: the result to date is: <ul style="list-style-type: none"> - 17 Interested in the bioeconomy pilot 	<ul style="list-style-type: none"> • In order to avoid overlaps with the Vanguard communication strategy, the task has been suspended <p>In 2019, following the evolution of Vanguard membership, further actions will be taken.</p>	

			<ul style="list-style-type: none"> - 2 No feedback (Auvergne, East Netherlands) - 7 Not interested (Tampere, South Denmark, Catalonia, Pays de la Loire, Galicia, Norte, Saxony) - 3 Promised a feedback that did not arrive (Lower Austria, Cantabria, Baden-Württemberg) 		
<p>Promote the participation of additional regions/players</p> <ul style="list-style-type: none"> • Collect information on regional priorities for targeted promotion 	Q2	N	<ul style="list-style-type: none"> • The activity has not been implemented 		
<ul style="list-style-type: none"> • Produce/distribute information in close cooperation with Vanguard communication unit 	Q2	Y	<ul style="list-style-type: none"> • When requested, constant cooperation with the Communication group has been granted throughout the year 		
<p>Increase visibility of the Pilot at European level</p> <ul style="list-style-type: none"> • Participation to events where the Pilot may be promoted 	Q1-Q4	Y	<ul style="list-style-type: none"> - 18/2: Vanguard & the BBI – presentation during the national workshop presenting the BBI Calls organised in 		

			<p>Rome by APRE (Daniele Colombo)</p> <ul style="list-style-type: none"> - 5-8/2: "Lignin Valorization by making biobased aromatics chemicals and materials" (Ludo Diels) BIOFOR conference Montreal - 4-7/3: "Lignin valorization and the way to bio-based aromatics" (Ludo Diels, Kelly Servaes), Dublin, Eco Bio Conference: (Pieter Vandezande) Cyprus, Lignocost meeting - 5-8/3: "General view on KETs applied to the Bioeconomy, State of the art in Biotechnology and Green Chemistry, Challenges of the future" (Ludo Diels) BIOKET conference Strasbourg - 13-14/3: "Membrane separation technology as a valuable and efficient tool in the value chain of wood towards chemicals and Materials" (Ludo Diels), Munich, Industrial Biotechnology Forum 		
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			<ul style="list-style-type: none">- 19-21/3: "Process Intensification and Biobased aromatics", (Ludo Diels) CPAC conference, Rome- 14/5: "Regional coordination of biomethane development: the Vanguard Initiative" presentation of Vanguard, the Bioeconomy Pilot & LNG demo case within the workshop "From waste to biomethane – Concrete trajectories for an expanding sector" organized in Milan by the Lombardy Energy Cluster (Daniele Colombo)- 15-16/5: "Membrane separation technology as a valuable and efficient tool in the value chain of wood towards chemicals and Materials" (Ludo Diels), Cologne, International Conference on Biobased Materials- 5-7/6: "Making bioaromatics a commercial reality and its market potential"		
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		N	<p>(Ludo Diels), Bangkok, 7th Biobased Chemicals and Plastics Conference</p> <ul style="list-style-type: none"> - 7-8/6: "Building a biomass innovation ecosystem in a circular bioeconomy in Poland", Kraków (Manfred Kircher) - 14/6: "Lignin valorization in Biorizon" (Joop Groen, Kelly Servaes) Lignin Valorization workshop BIOSPEED, Paris - 23/8: "Lignocellulose ethanol and lignin valorization" (Ludo Diels) FIPI R&D Conclave, Goa, 22-24 August - 11/9: "Emerging Regional Bioactivities in Belgium" (Ludo Diels), World Bioeconomy Forum, Ruka, 11-13 September - 17/9: "Membrane separation technology as reliable and efficient tool in the value chain of wood towards chemical and materials" (Ludo Diels), Lignin 		
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<ul style="list-style-type: none"> • Support to Pilot members when participating to specific demo case related events 			<p>Conference, Edmonton, 17-20 September</p> <ul style="list-style-type: none"> - 25/10: "Lignin depolymerization and valorization" (Viviana Pollizi) Nordic Wood Conference, Helsinki, 23-25 October - 7/11: "Biobased aromatics, challenges, hurdles & opportunities" (Ludo Diels), rio de Janeiro, SIPS conference 5-7 November - 15/11: Biorizon event, 's Hertogenbosch - 7/12: "New opportunities for the Biobased Economy" (Ludo Diels), Vienna, 6-7 December <ul style="list-style-type: none"> • Not requested 		
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2. Demo cases

2.1 Lignocellulosic biorefinery

Action planned	Time	Accomplished (Y/N)	Short presentation	Corrective action	Annex
Organize meeting with core team to develop further the concept	Q1	Y	A face2face meeting was not necessary to establish the core concept. The	Organize meeting at a later stage and involve more regions than the	Demo case Lignocellulosic Biorefinery

			exchange has been done by email rounds.	core team. Combine this with an important event in Brussels to accommodate time and budget constraints.	
Involve triple helix partners or triple helix clusters, assure commitment	Q1	Y	The composition of the core team consists of business (Scotland, BBD/Randstad) knowledge (Wales) and government (Flanders) representatives. The vacancy in the Randstad region has recently been filled.		
Development of promotion material to solicit interest by the other Vanguard regions	Q2	N	Next to the general description of the demo case, it is advisable to include some specific points related to link with existing EU projects and financing possibilities. Towards this end a document has been written by both BBD and Scotland as input to PNO questionnaire.	The promotion material will be delayed by one quarter.	Questionnaire PNO by BBD on lignin valorization Draft Scotland on wood biorefinery Possibility to combine
Approach the other Vanguard regions by mail to participate in the expert group	Q2	N	As part of the pilot we now have a good insight in the regions that have interest in Vanguard. A couple of regions that have woody biomass available still need to express their position	Delayed to 2019	

Test interest, If sufficiently high (at least 2 other regions commit) continue	Q2	N	<p>This test will follow once the above two action items have been completed.</p> <p>Next to Randstad, Zuid-NL, Flanders, Wales and Scotland, Slovenia has emerged as a new region with high interest in Lignocellulosic demo.</p>	Delayed to 2019	
Organize meetings with experts to develop the concept further (Q3 2018)	Q3	Y	<p>During the summer a meeting between Randstad region/Zuid Netherlands (BBD) and Scottish Enterprise has been organized around lignocellulosic biorefinery.</p> <p>A consortium has been established by Randstad (Redefinery project team), consisting of multiple stakeholders from Randstad,Zuid-NL, Flanders, Sweden</p>		
Connect to experts representing the triple helix	Q3	Y	<p>A stronger link with the Composite Center in Wales has been secured by participation of Adam Charlton in the working group.</p>		
Develop a bottom-up plan	Q4	Y	<p>In the General Meeting in Brussels a plan has been presented consisting of</p>		

			<p>three different Biorefinery business models: (1) close to feedstock (Scotland); (2) close to market (Randstad) (3) Local4local (Slovenia)</p> <p>These business cases will be developed next to each other, using Vanguard network, sharing information, comparing results with joint learning</p>		
Involve interested parties with a sound concept	Q4	Y	<p>Scotland: softwood to cellulosic sugars for bioethanol, with lignin to energy Randstad (Redfinery): hardwood to C6 sugars for chemicals, C5/C6 to bioethanol and lignin to bio-bitumen Slovenia: a forest driven comprehensive proposal with follow-up to select the most appropriate routes and products (Q1-2019)</p>	<p>More discussion needed with companies in the region</p> <p>The project needs financing and an operator in the heart of the value chain</p> <p>Core team review scheduled for January 2019. Expert session in Brussels Q1</p>	
Collect all necessary information-analysis	Q4	N	Only part of the necessary information-analysis is completed. More work is needed	Complete in Q1 -2019	
Develop a process for establishing common priority	Q4	Y	The approach is to bring all three business cases under the demo case		

2.2 Bio-aromatics

Action planned	Time	Accomplished (Y/N)	Short presentation	Corrective action	Annex
Draft business plan, based on the summary document resulting from the 5/12 meeting, drafted by the case leader. All regions are invited to give comments	Mid-April	Y	At the end of 2017 a first meeting was organized with all the interested regions. Based on the presentations and several bilateral discussions, a document was made highlighting the strengths in a smart specialization and the place in the value chain. Now a business plan is under construction in order to define a logical order in the different value chains and commitments of the regional authorities and companies.	Sometimes, focus on unique skills or selling properties was missing leading to too broad descriptions. These needed to be negotiated again. This lead to some delay. Some regions are interested, but not yet member of VI.	Plan will be provided soon
Drafting of a final business plan	Mid-June	N	We need more time to get the agreement among the partners and to know which regions will really commit. Also some regions are not yet member of Vanguard and need to do the necessary steps if they want to join the business plan.	The final business plan will be presented at the Vanguard meeting Case Bio-aromatics on 14 November 2018 in Den Bosch	

New Pilot plants initiatives	January	Y	New Lignovalue pilot plant is approved in Flanders and under preparation		
Lignin application lab	September	Y	In Bergen-op-Zoom a new application lab is started and is working on its expansion (new facilities at the Green Chemistry Campus).		
Integration with other pilots	April	Y	In April the project ALIGN is started in which pilot plants of LXP (from Brandenburg) and LFP (in Leuna, Sachsen-Anhalt) are integrated in the Bioaromatics research and production.		
Business plan discussed in a first working group meeting	September	Y	A TSSP-value chain business plan is made in a first draft and sent to DG-Regio on 22 December 2018 to be finalized end 2019		
Biorizon/Demo case annual event	November	Y	The event took place on 15 November with a meeting of the bioaromatics case on 14 November. Update of the involved regions activities is available		

2.3 LNG

Action planned	Time	Accomplished (Y/N)	Short presentation	Corrective action	Annex
assessment of the results in the different regions	03/18	Y	A document summarizing the contribution from participating regions (Lombardy, Emilia Romagna, Upper Austria, South Netherlands, North Rhein Westfalia) has been produced. Interest from Trentino and East Netherlands have been collected but active participation still to come.		Bio LNG Concept Note – ver 7
Workshop (supported by ReConfirm) starts the drafting of a more detailed business plan	04/18	Y	Together with ReConfirm, the information collected in the previous point has been analyzed and reorganized in a shorter document more focused on the potential drafting of a business plan. Due to the difficulty in matching different agendas, the one day Workshop will be held slightly beyond schedule, on July 3 rd , in Milan.		Workshop programme & Preparation Document drafted with ReConfirm + Workshop Report
First draft of a business plan and	06/18	N	Delayed	The goal of the above mentioned workshop is	

beginning of its implementation				to further develop the idea emerged so far in order to provide ideas for the development of a business plan that will start in Q3, after the Workshop.	
Assessment update	10/18 12/18	Y	The document summarizing the contribution from participating regions has been updated according the new inputs received (i.e. North Rhein Westfalia) Meeting with PNO to scan possible call for application: a set of calls has been proposed but none of them were feasible for the demo case.		Bio LNG Concept Note – ver 9 2018.10.02_Grant scan Vanguard (DEMO Case Bio-LNG blue corridor, ASTER & Lombardy Green Chemistry Association)
Development plan	Q4		Conference call of alignment to design a first business plan	Delayed to 2019 (Q1/Q2)	
Validation of value chains	Q4		Conference call of alignment to design a first business plan	Delayed to 2019 (Q1/Q2)	

3. New Demo cases

Title	Proposer	Brief description	State of the art	Annex
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<p>Biobased plastics</p>	<p>Malopolska</p>	<p>Bioplastics production demo Case on PHA. The demonstration activities intend to assemble a bioplastics production line that is envisaged to valorise generated oil wastes available from food industry, the biorefinery by-products generated in production of biofuels and/or wastewaters. Also certain bio-resources (wood and green biomass, converted either to sugar mixtures or volatile fatty acids (VFAs) via enzymatic preparations) will be directed to produce PHAs biopolymers as oppose to their use in energy generation.</p>	<p>Malopolska has provided a concept note on the model used for previous demo cases. It has been presented and discussed with the Pilot's Steering Meeting on June 14. Further comments will be sent directly to Malopolska who will develop a new version that will be given wider circulation amongst the Bioeconomy Contact Points in the VI regions. If all conditions are met, the goal is to present the demo cases to the General Meeting on November 13 for formal approval.</p> <p>The proposal has been presented and discussed during the Pilot General meeting in Brussels in November focusing on PHA. The overall agreed assessment is that it requires further work in order to become eligible for Vanguard support. The drafting of the next steps along this line have</p>	<p>"Case for joint-demonstration Biobased plastics" concept note</p> <p>New Pilot Proposal presentation (Brussels November 13)</p>
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			<p>been agreed upon and added to the 2019 Action Plan.</p> <p>Thanks to the meeting in Brussels, interesting contacts between Malopolska and the IBIS Consortium (Piedmont www.poloibis.it/) have been established, with the involvement of local major companies (Novamont). In addition, companies of the IBIS Consortium and the Lombardy Green Chemistry Cluster have signed a cooperation agreement to jointly develop projects on PHA, thus reinforcing the current proposal.</p>	
Charcoal	Malopolska		<p>Some discussion have been already ongoing between various regions, but a fully comprehensive concept note is still in the pipeline. When available, the same process as in the previous point will be followed.</p>	

			For the time being, Malopolska does not consider this proposal as a priority and it has been dropped.	
Pilot bio-refinery plant concept	Slovenia	Slovenia has provide a very schematic outline of its proposal, based on a SWOT analysis of the country itself	<p>Slovenia has provided a concept note. It has been presented and discussed with the Pilot's Steering Meeting on June 14, focusing in particular on the synergies with the already existing demos lignocellulosic biorefinery & bioaromatics. Further comments will be sent directly to Slovenia who will develop a new version that will be given wider circulation amongst the Bioeconomy Contact Points in the VI regions. If all conditions are met, the goal is to present the demo cases to the General Meeting on November 13 for formal approve.</p> <p>The proposal has been presented and discussed during the Pilot General meeting in Brussels in</p>	<p>"Pilot bio-refinery plant concept outlined"</p> <p>New Pilot Proposal presentation (Brussels November 13)</p>

			<p>November. The overall agreed assessment is that it requires further work in order to become eligible for Vanguard support with a special focus on:</p> <ol style="list-style-type: none"> 1) get a better focus on specific value chains 2) assess the integration with the existing demo cases Lignocellulosic Biorefinery and Bio-aromatics <p>The drafting of the next steps along this line have been agreed upon and added to the 2019 Action Plan.</p>	
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4. External support

The 2018 budget allocated a maximum of 12.000€ for external support in the development of the Pilot. The Steering Committee agreed that this external support should be focused on the search for financing opportunities for the pilot/demo. An open call to different qualified consultancy firms was launched but only **PNO** sent an offer that was accepted and implemented along the following lines:

1. Grant Scan: mapping the available grant opportunities for specific innovative ideas coming from the Pilot. Based on the information provided by the Demo Cases, **PNO has identified the available grant opportunities which are in line with**

the Pilot's assets and strategic goals, one for each active demo case; an additional Grant Scan for the Biololymers new demo case is being finalized. Within this context, PNO carried out the following activities:

- Collection of relevant information from each Demo case to carry out the analysis;
- Mapping the available grant opportunities and informing the Demo case about them at early stage;
- Identification and prioritisation of the most beneficial grant opportunities according to each Demo case objectives and strategic goals.

2. Linking, to support the Pilot/Demo Cases in identifying relevant linking opportunities and ensuring the involvement in consortia that prepare a project proposal responding to H2020 and/or LIFE calls. Within this context, PNO will carry out the following activities:

- Identifying linking opportunities and informing the Pilot about them and facilitating the integration of the Pilot in the consortium;
- Facilitating the communication between the Pilot and the consortium in order to provide the required information;

A contract with PNO has been signed by the Lombardy Green Chemistry Cluster and activities along both lines are under way.

The activities carried out within this framework, in particular within the BBI initiative, did not produce any tangible result and therefore haven't been calculated in the final payment.

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5. Budget

On October 19, an Amended Budget has been approved together with the report on the First Semester of 2018.

	Approved budget	Expenses I Semester	Amended budget	Total 2018 expenditure
- Administrative support	2.000,00	1.500,00	6.000,00	3.000,00
Sub-total	2.000,00	1.500,00	6.000,00	3.000,00
External expertise and services costs				
- External support (financing)	12.000,00	12.000,00*	12.000,00	5.000,00
- Demo case events & support services	18.000,00	3.000,00**	6.000,00	1.668,70
- Demo case management & activities			15.000,00	
- Pilot technical coordination	18.000,00	10.000,00	21.000,00	21.000,00
- General pilot events	1.000,00		1.931,00	652,93
Sub-total	49.000,00	25.000,00	55.931,00	28.321,63
Office and admin expenditures				
Sub-total	0		500	
Travel and accommodation costs				
- Travel, accomodation, subsistence	2.000,00		2.000,00	533
Sub-total	2.000,00		2.000,00	533
Equipment expenditure				
Sub-total	0		0	
Total expenditure	53.000,00	28.000,00	64.431,00	31.854,63
Payments				
Total approved budget 2018				64.431,00
Total expenditure 2018				31.854,63
Positive balance to carry on to 2019				32.576,37
First advance payment (28/10/2018)				28.450,00
Second advance payment (14/12/2018)				18.337,00
Total advance payment				46.787,00
Excess advance payment				14.932,37

Explicatory notes

Staff costs

Due to internal organizational reasons, it was not possible for Italtotec, the company dealing with the administrative management of the Lombardy Green Chemistry Cluster, to allocate Cluster staff to the Pilot activities. The administrative support was therefore provided by Italtotec staff and consequently reported with an invoice.

External expertise

PNO

The 12.000€ budget, that the contract allocated to the two services “Grant Scan” and “Linking”, was intended to be paid on the basis of the services actually provided. While the “Grant Scan” has been successfully completed, the “Linking” service provided no results and it was agreed with PNO that its cost (up to 7.000€, depending on the number of successful “links”) would not have been paid for.

Demo case events & support services

This budget was intended to support the Demo Cases in organizing events and initiatives at demo case level. Only the Bio-aromatics demo case required – and the Steering Committee approved – a contribution of 3.000€ for the organisation of the Demo event on November 14 in 's-Hertogenbosch in between the Pilot General Meeting (November 13) and the Biorizon project meeting (November 15). The actual expenses amount at 1.668,70€.

Demo case management & activities

This item was added with the amended budget. It was agreed upon by the Steering, hoping that the availability of funds to directly co-finance the activities of the Demo Cases coordinators would have helped speeding up Vanguard related activities. Despite the continuous efforts to implement the activities at Demo case level, none of the eligible subjects have reported such costs for 2018.

The attempt to move at demo case level the possibility of spending Vanguard resources, under clear rules, has proven unsuccessful in stimulating additional activities: in 2019 a different approach will be followed.

Travel accommodation and subsistence

Include the costs referred to Daniele Colombo mission to Brussels (November 12-13, Pilot General Meeting) and Ilaria Re mission to Bilbao (November 28/29, Industrial Modernization Platform meeting).

6. KPIs

Bio-aromatics KPI –2018

The monitoring and evaluation steps will be based on the deliverables of the on-going projects. We suggest that we list all projects that can be considered under the VI and put in a table the progress, commitment of companies and progress toward pilot plants.

An overview of involved companies will be provided. For confidentiality reasons the topics will not be provided.

Number of projects involved	17
Budget of the projects involved	43 000 000
Number of companies involved	➤ 60 companies
Number of product lines proposed	3 (thermochemical, Sugar-based, Lignin-based)
Number of regions involved (VI-member and non-member: as agreed, from November VI participation rules will be applied as the VI business plan will be presented in Den Bosh – 14/11/18)	18

Lignocellulosic biorefinery KPI – I semester 2018

Number of regions involved and committed via regional governments	6 (Flanders, Randstad region, South Holland, Scotland, Wales, Slovenia)
Number of companies involved and committed	6 Ref list below
Number of knowledge institutes involved and committed	4 ref list below
Number of new Value chains identified (for regions)	1 lignin to bio-bitumen

Companies involved (Redefinery consortium)

1. Corbion (Randstad region - NL)
2. Process Development Center (South Netherlands - NL)
3. BAM (South Netherlands - NL)
4. SEKAB (Vesternorrlands, Sweden)
5. Nedvang (Randstad region - NL)

6. Alcogroup (Flanders - BE);

New Biorefining projects in Scotland and Slovenia are expected to yield additional regions and companies involved in the near future.

RTOs involved

1. Technical University Delft and Bioprocess Pilot Facility (Randstad - NL)
2. VITO (Flanders - NL)
3. Asphalt Knowledge Center (South Netherlands - NL)
4. Biocomposite Centre (Wales - UK)
5. Scottish academia via IBIOIC (Scotland - UK)

LNG Blue Corridors KPI – I semester 2018

Number of regions involved	6 (Emilia Romagna, Lombardy, North Rhein Westfalia, Flanders, South Holland, Upper Austria)
Number of companies involved	8 Ref. list below
Number of knowledge institutes involved and committed	6 Ref. list below
Number of new Value chains identified	1 (agro-food waste to Bio-LNG for regional bus service)

Companies involved

1. Fachverband Biogas (North Rhein Westfalia)
2. CryoPur (Lombardy)
3. Gruppo CAP (Lombardy)

4. Sebigas (Emilia Romagna)
5. Maganetti Spedizioni (Lombardy)
6. Ankogaz spa (Lombardy)
7. SOL Spa (Lombardy)
8. T-PER - Agenzia di Trasporti Regionale (Emilia Romagna)

RTOs involved

1. Wood K Plus (Upper Austria)
2. Energieinstitut Linz (Upper Austria)
3. CRPA (Emilia Romagna)
4. LEAP (Emilia Romagna)
5. Università Milano Bicocca (Lombardy)
6. Vito (Flanders)

KPI - Actions of general interest for the pilot –2018

Number of reports produced	6 Steering Group Meeting reports 3 Demo Case description to PNO 2 New Demo Cases report for assessment & implementation
Number of regions/key players contacted	30
Number of regions/key players mapped	17 (out of 30 - regions that declared an interest in the Bioeconomy Pilot and provided contact points for further actions)
Number of internal meeting	6 Steering Meetings (13/2; 9/4; 14/6; 12/9; 10/10; 12/12) 1 General Meeting (13/11)
Number of events where the pilot has been promoted	18 (see above for detailed list)