

Development of Business Cases for FCH Applications for Regions and Cities

4th General Assembly Meeting



4th General Assembly Meeting, 16 November 2017 in Brussels

Draft Agenda

Topic	Presenter	Time
<i>Welcome coffee and registration</i>		09:30 – 10:00
A. Introduction and "State of the Union"	FCH2 JU, RB	10:00 – 10:15
B. Results of 2 nd Self-Assessment Survey	RB	10:15 – 11:00
C. Project interim feedback discussion (end of Phase 1)	FCH2 JU	11:00 – 11:15
D. Ranking of FCH applications for project focus in Phase 2	RB	11:15 – 11:45
E. Break-out sessions in groups: discussion of survey results and ranking	RB	11:45 – 12:30
<i>Lunch break</i>		12:30 – 13:30
F. Final discussion and agreement on applications ranking for Phase 2	RB	13:30 – 14:00
G. General project scope, approach and organisation for Phase 2	RB	14:00 – 14:45
<i>Coffee break</i>		14:45 – 15:00
H. Break-out sessions in groups: discussion and input regarding Phase 2	RB	15:00 – 15:45
I. Conclusion and next steps	FCH2 JU, RB	15:45 – 16:00
J. Networking drinks/ get-together	-	from 16:00 on






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A. Introduction and "State of the Union"



Coalition keeps on growing – Phase 1 will be concluded today, Funding and Financing Navigation Tool will be distributed shortly

Project status – End of Phase 1

-  The coalition has been continuously growing to now **90+ Regions and Cities from 20+ countries, as well as more than 55 industry partners**
-  **Technology Introduction Dossier, Preliminary Business Case Analyses & Strategic Fit Assessment** have been completed and distributed
-  The **2nd Self-Assessment Survey** has been completed by 56 Regions and Cities – Results and application ranking for Phase 2 will be discussed today
-  The **Funding and Financing Navigation Tool** now includes **120+** data sets; a search tool has been developed and will be distributed shortly
-  **Participation in several local and regional events and workshops** increased outreach of project and fostered understanding of technology

Today is last GAM of Phase 1 – Ranking of applications and way forward for Phase 2 will be focus of discussion

Overview of project status for each module

Phase 1: Preliminary business cases

- 1 Regional "self-assessment" survey as initial market screening (a)
Technology introduction for Regions/Cities (b)
- 2 Assessment of preliminary business cases (generic)
- 3 Assessment of "fit" for Regions/Cities (refined market screening)
- 4 Ranking of applications

5 Mapping funding/financing mechanisms

6 Communication outreach/impact

Phase 2: Detailed business cases, roadmaps

- 7 Detailed business cases
- 8 Concept for maximising use of funding
- 9 Roadmap and implementation plan
- 10 Engagement of local stakeholders

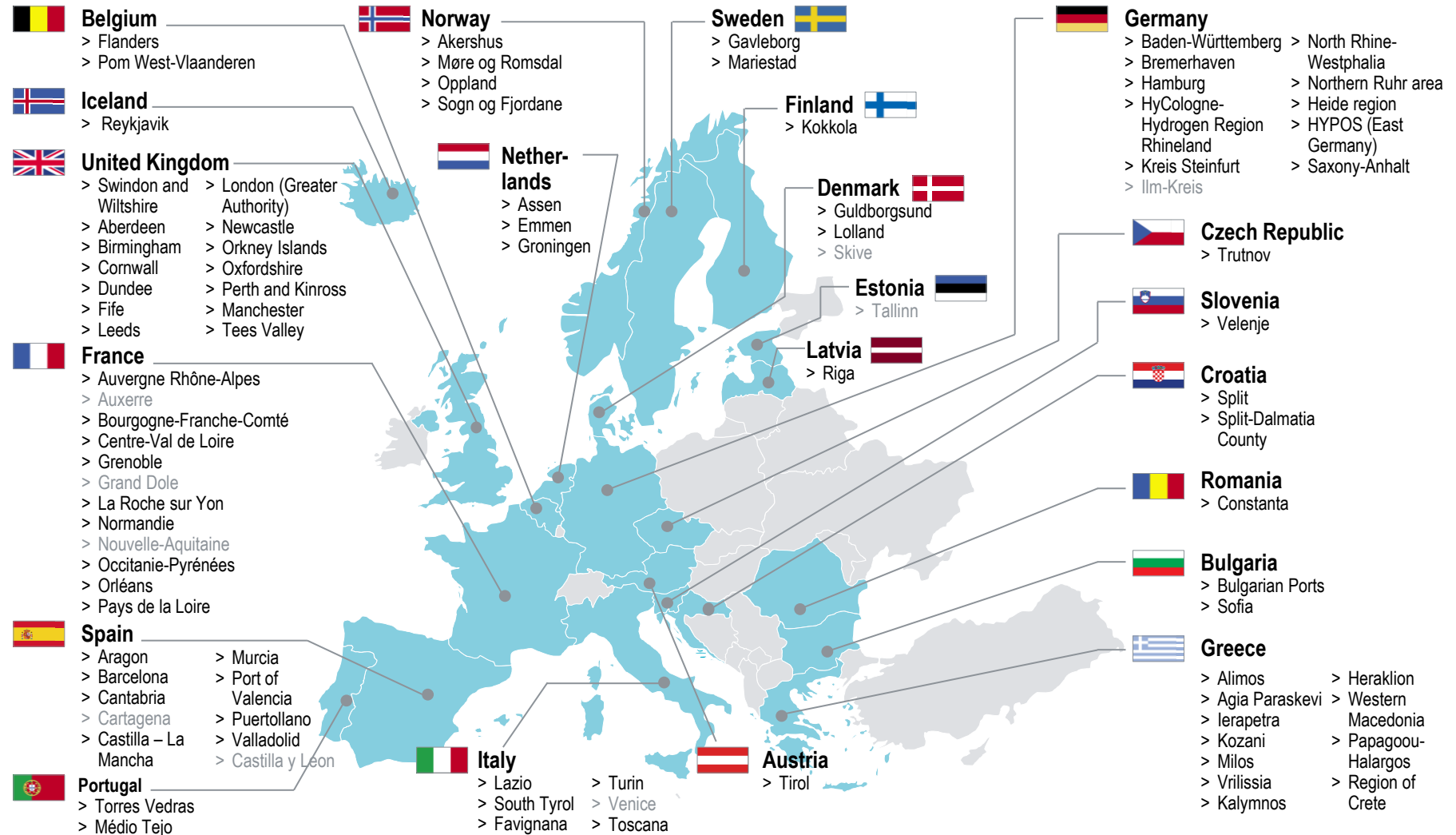
For H₂ valleys ("Tier 1 Regions/Cities")

For demonstration projects ("Tier 2")

11 Dialog platform for technology development ("Tier 3")

Modules completed Modules under way Pending modules

90+ Regions from 20+ countries now form part of the project – And the coalition keeps on growing



Legend: Signed MoU / "Observers" or "in MoU process"

The coalition of 90+ Regions & Cities represents approximately one quarter of the European population, surface and GDP

Key facts about the project coalition of Regions & Cities¹⁾

~160 participants...

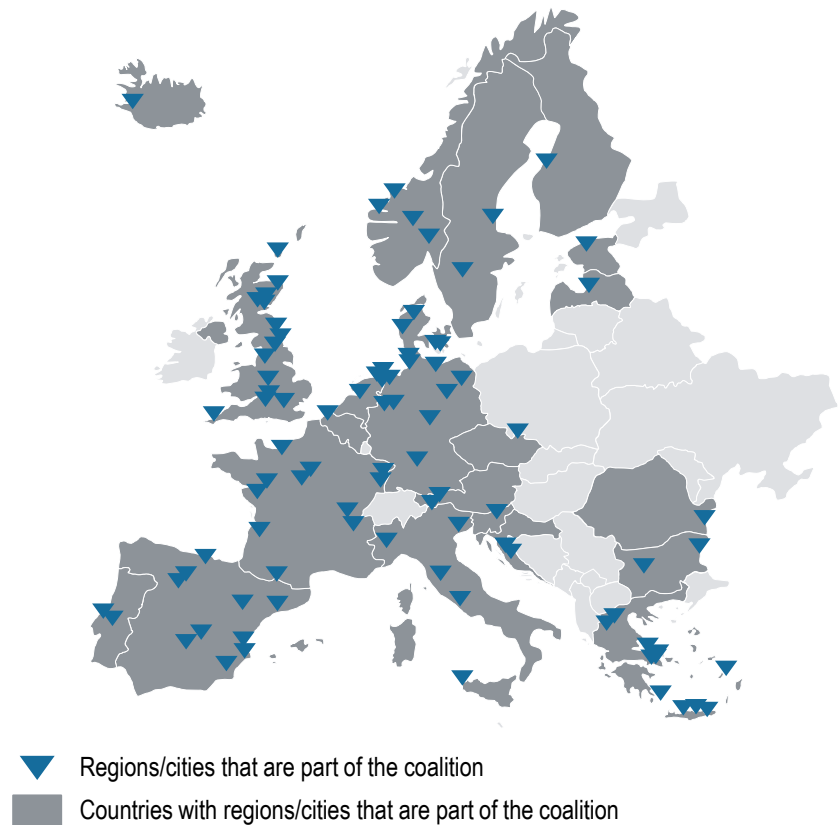
...from **90+** Regions & Cities...

...representing **22** European countries...

...comprising ca. **28%** of European population....

...covering ca. **24%** of European surface...

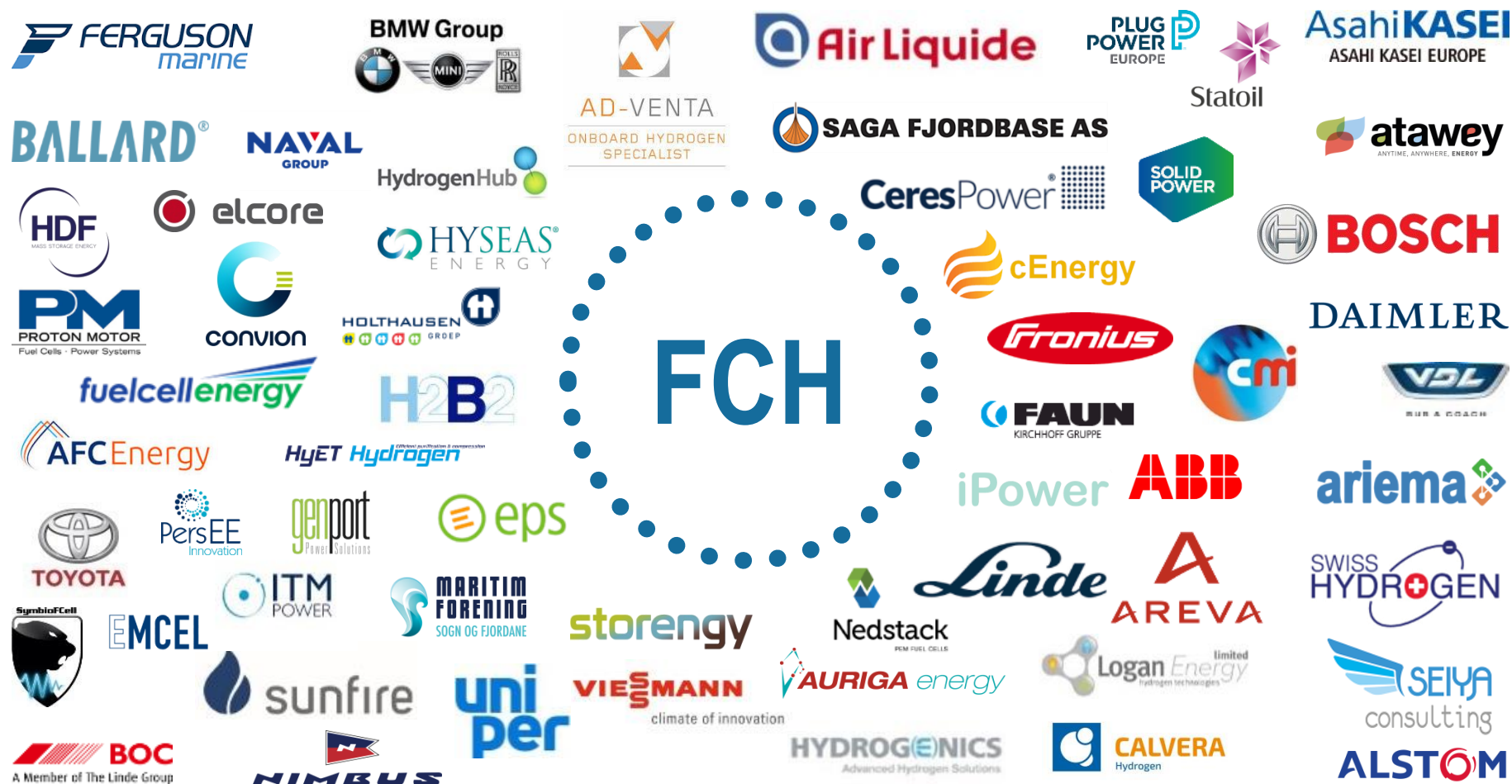
...and ca. **27%** of the European GDP being generated in the participating Regions & Cities



1) Incl. nine Regions and Cities with "Observer" or "in MoU process" status

More than 55 FCH industry players (and counting) have also become part of the project by now

Current FCH industry participants



B. Results of 2nd Self-Assessment Survey



Participation in the 2nd survey was once again high, underpinning the pan-European interest in future FCH application deployment

Key facts about the survey

56 fully, **7** partially completed surveys¹⁾...

...from **16** European countries...

comprising **>16%** of European population...

...covering ca. **15%** of European surface...

...with **>98%** of the participants indicating a moderate to strong interest in future deployment of FCH applications²⁾



1) All answered questions were included in survey evaluation 2) 98.3% of participants (n= 59) answered with either 3, 4 or 5 points on a 5-point Likert Scale (5 = very strong interest) to the question: "How interested is your region/city in actively pursuing the future deployment of FCH applications?", an increase by ~4% compared to 1st self-assessment

The survey consisted of three main parts and built on analysis results of the project so far, enabling an informed ranking process

Key elements of the 2nd self assessment survey

A Partial update of the self-assessment

> Examples:

- How interested is your Region/City in actively pursuing the **future deployment** of FCH applications?
- Within your Region/City, which **hurdles and challenges** currently pose obstacles to the deployment of FCH applications?

B Multi-criteria scoring model (bottom-up)

	C1	C2	C3	...
App 1	■■■■	■■■■	■■■■	...
App 2	■■■■	■■■■	■■■■	...
App 3	■■■■	■■■■	■■■■	...
App 4	■■■■	■■■■	■■■■	...
App 5	■■■■	■■■■	■■■■	...
App 6	■■■■	■■■■	■■■■	...

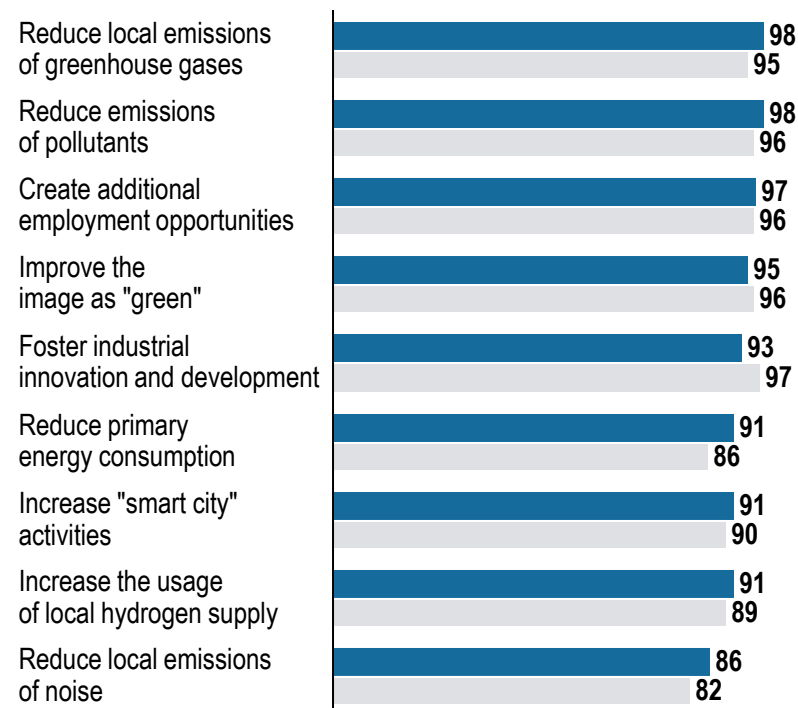
C Top-down ranking with key reasoning

1	App 1	Concrete use case description
2	App 2	Concrete use case description
3	App 3	Concrete use case description

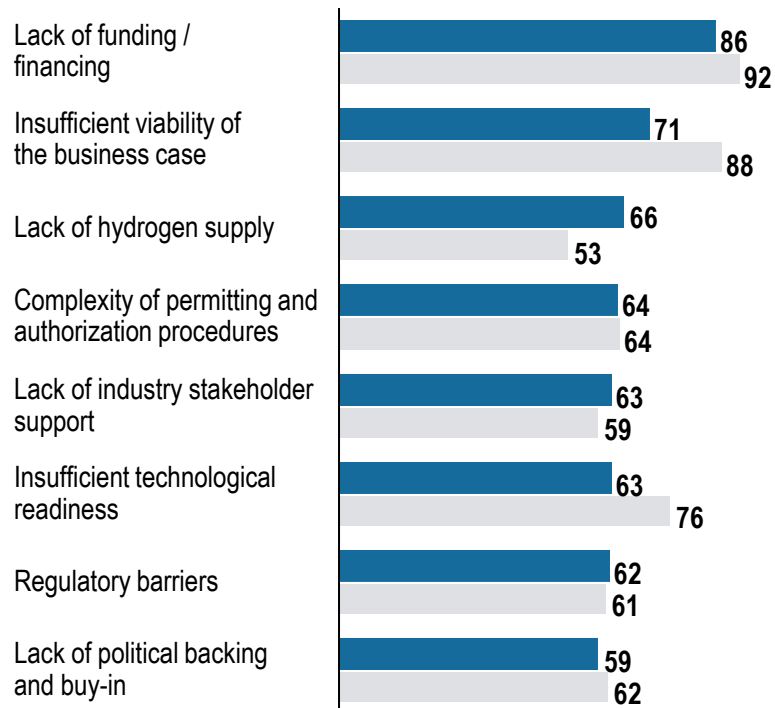
Whereas perceived benefits of FCH deployments remain largely stable, some perceived challenges have decreased considerably

Comparison of selected answers from 1st and 2nd self-assessment¹⁾

Main reasons for pursuing FCH applications [%]²⁾:



Main obstacles and challenges [%]³⁾:



1st self assessment (June 2017) 2nd self-assessment (October/November 2017)

1) Percentage share of participants who set either 3, 4 or 5 points on a 5-point Likert Scale (5 = very important)

2) "What are your region's/city's main reasons for pursuing FCH applications? How relevant and important are typical drivers for FCH technologies to you, also compared to one another?"

3) "Within your region/city, which hurdles and challenges currently pose obstacles to the deployment of FCH applications?"

The ranking of applications for Phase 2 will be based on evaluation provided by Regions & Cities in online survey and discussed today

Reminder: Ranking process of FCH applications for Phase 2

Bottom-up ranking by Regions & Cities via online survey:

- > Selection of 6 applications
- > Evaluation on 11 criteria

Top-down ranking by Regions & Cities via online survey:

- > Selection of top 3 priority applications
- > Local use case description

Consolidation of rankings

1. ...
2. ...
3. ...

1. ...
2. ...
3. ...

1. ...
2. ...
3. ...

Discussion of final ranking of up to 10 applications for Phase 2 ...

1. ...
2. ...
3. ...
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... and final agreement in the GA today

For the bottom-up ranking, applications have been ranked based on their accumulated score from all participants on 11 dimensions

Bottom-up ranking: Methodology

ILLUSTRATIVE

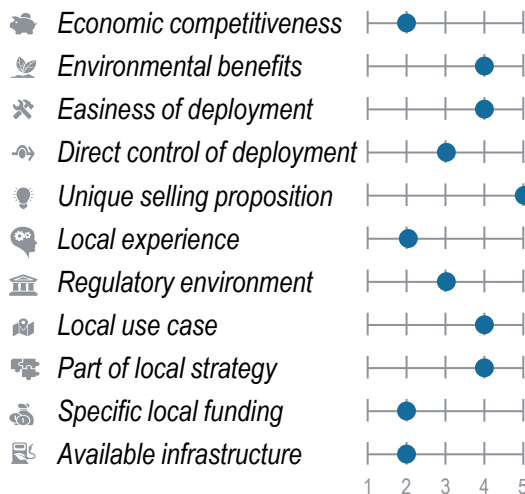
1 Selection

Each Region and City selected the 6 most interesting or relevant applications for potential future FCH deployment projects out of all 27 applications discussed in the project

Buses	Boats
Cars	Commercial buildings
Trains	Ships
Delivery vans	Port ops. equip.
Heavy-duty transport	Back-up power
Garbage trucks	Ferries
H2 production	Off-grid power
Bikes	Scooters
H2-to-X	Resid. use/ mCHP
Sweepers	Gen-sets
Grid services	Aircraft
Material handling	Airport handling equip.
H2 into gas grid	Construction equip.
Industrial use case	

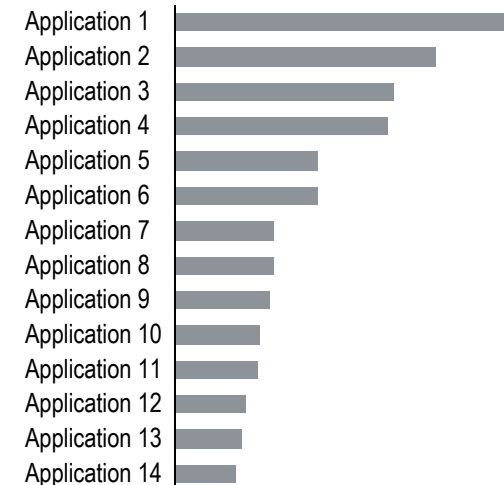
2 Evaluation

For each of the 6 selected applications, Regions and Cities evaluated the 11 dimensions listed below on a 5-point Likert scale (1= totally disagree, 5= totally agree)



3 Ranking

Evaluations on all dimensions were attributed scoring points from 0 to 4 (0= totally disagree, 4= totally agree). For the ranking, scoring points reached by each application across all participants were summed up



Buses clearly lead the bottom-up ranking followed by other mobility applications – Hydrogen production also key area of interest

Bottom-up ranking: Results

Application	# of scoring points	# of selections	Application	# of scoring points	# of selections
Buses	968	42	Boats	178	8
Cars	765	34	Commercial buildings	173	9
Garbage trucks	639	28	Ships	165	8
H2 production	624	28	Port ops. equip.	156	7
Trains	420	19	Back-up power	155	8
Delivery vans	420	18	Ferries	135	6
Heavy-duty transport	293	15	Off-grid power	135	6
Bikes	290	13	Scooters	129	6
H2-to-X	281	13	Resid. use/ mCHP	117	5
Sweepers	251	11	Gen-sets	55	3
Grid services	246	11	Aircraft	48	2
Material handling	209	10	Airport handling equip.	47	3
H2 into gas grid	199	11	Construction equip.	38	2
Industrial use case	178	10			

For the top-down ranking, applications have been ranked according to the number of their selections as Top 1, 2 or 3 priority application

Top-down ranking: Methodology

ILLUSTRATIVE

1 Selection

Each Region and City ranked the 3 applications of top priority for potential future FCH deployment projects out of all 27 applications discussed in the project

1.1 Use case description¹⁾

For each of the 3 ranked applications the survey asked for a specific local use case description and indicative deployment figures for the application

2 Ranking

The ranking results exclusively base on the number of selections of each application as top 1, 2 or 3 priority. Points from 3 (top 1 priority) to 1 (top 3 priority) were attributed and the total score aggregated

1. Buses | 2. Cars | 3. Trains

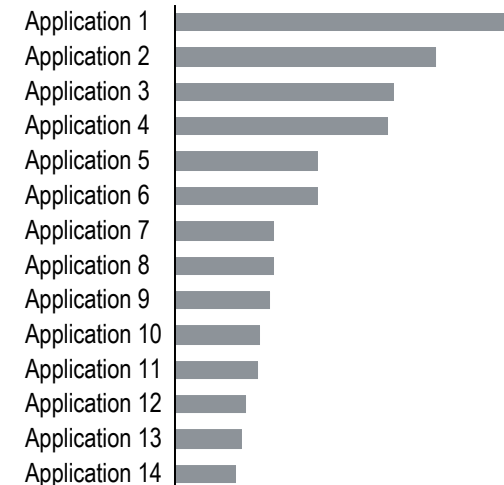
Delivery vans	Commercial buildings
Heavy-duty transport	Ships
Garbage trucks	Port ops. equip.
H2 production	Back-up power
Bikes	Ferries
H2-to-X	Off-grid power
Sweepers	Scooters
Grid services	Resid. use/ mCHP
Material handling	Gen-sets
H2 into gas grid	Aircraft
Industrial use case	Airport handling equip.
Boats	Construction equip.

1. Garbage truck

"Local public waste disposal company (daily range of 80km, currently high inner city noise pollution) with procurement of 3 garbage trucks in 2018 and 2 additional trucks in 2020"

2. ...

"xxx"



1) Use case descriptions and deployment indications were not considered for execution of the top-down ranking, but were evaluated separately

The results of the bottom-up ranking are mirrored in the top-down ranking – Top 6 applications remain the same

Top-down ranking: Results

Application	# of scoring points	# of selections	Application	# of scoring points	# of selections
Buses	68	33	Sweepers	7	5
Cars	43	23	Boats	7	4
H2 production	33	13	Ferries	6	3
Garbage trucks	29	15	Resid. use/ mCHP	5	2
Trains	20	10	Back-up power	5	2
Delivery vans	19	10	Off-grid power	5	3
H2-to-X	16	7	Material handling	3	2
H2 into gas grid	14	5	Airport handling equip.	3	1
Grid services	14	8	Industrial use case	3	2
Bikes	13	8	Scooters	2	2
Heavy-duty transport	10	6	Construction equipment	0	0
Ships	10	6	Aircraft	0	0
Commercial buildings	10	4	Gen-sets	0	0
Port ops. equip.	9	6			

Top ranked applications are already supported by a number of concrete plans for projects; others have less specific perspectives

Examples¹⁾ of specific local use cases as described in survey (1/2)

Rank 1: Buses

"Through the regional strategy, the **regional government body intends to work with operators to gradually replace the bus stock in the region.** There is an intension to start integration of low/ zero emission buses into the fleet **as and when funding can be sourced** and a competitive TCO business case can be made. The **first replacements are planned in the next 2-3 years (10-20 buses)** with additional phases of bus replacement over the coming decade. Whilst a couple of routes may be suitable for BEV buses **the majority of routes are intra-urban and will require either FCH or Bio-Methane fuelled buses.** The government body is currently scoping options for funding in coming months."

"The **city has good experience of operating hydrogen buses:** 10 buses are currently deployed and 20 more are set to be deployed as part of JIVE (planned for 2019). There are a number of **targets for reducing emissions** in city's buses in the local mobility strategy and environmental strategy - this includes **the whole fleet to be zero emission by a certain date.** As a result there is focus on transforming the fleet and an awareness about hydrogen buses - particularly in terms of demanding routes, and the benefits of fuelling over charging. **A city organisation is currently carrying out a feasibility study** for the local transport operator looking at the commercialisation of buses in the early 2020s - addressing buses, suppliers, hydrogen source/cost and also raising awareness/engagement internally and externally. **Several hundreds of buses to be replaced."**

Rank 13: Commercial buildings

"The County can easily **install fuel cell cogeneration units in public schools** that are close to natural gas pipeline"

"It is proposed to **install** (through demo projects) FC using natural gas for **CHP at the Municipality Swimming Hall and another public building,** as well as in commercial and residential buildings."

"Exploring stationary fuel cell applications and how fuel cells could be integrated into a building energy management system. **Looking to develop an integrated building energy management system utilising fuel cell and battery storage technologies."**

1) Answers have been anonymised

Whereas some Regions and Cities already have concrete plans, others gave no or rather vague indications of project ideas

Examples¹⁾ of specific local use cases as described in survey (2/2)

Rank 2: Cars

*"The **city has a growing infrastructure of stations** - 4 in operation; 3 in development and potentially another station (dependent on funding). After early deployment in small numbers, the **amount of cars deployed are increasing exponentially** - with 60 cars via an EU project, and we also expect to see a market increase in cars as a result of central government funding (subject to confirmation). **Engagement has become more developed** and the benefits have been particularly recognised (re. range & resilience) for organisations such as emergency services and taxis. **Targets have been set for zero emission transport** - ref the strategy documents mentioned above."*

*"**Deployment in the next 4 years of a fleet of 15 to 20 new FC-cars** at local level. Vehicles will be managed by public organisation and rented to local companies, which can brand the car and take advantages of PR packages as testimonials of zero-emission mobility. A collaboration with taxi service providers is also foreseen to deploy FC-cars in their services."*

*"**Expand on the current 10 cars deployed** in the region by fleet management company provided by OEMs (Hyundai, Honda, Toyota) need to test and demonstrate. **Infrastructure in place** - namely 2 refuelling stations. **More deployment necessary** to continue proving and demonstrating benefits, and to underpin infrastructure costs **and deployment related to other priorities e.g. delivery vans and buses**. Also to maximise use of existing infrastructure making HRS more operationally and financially viable."*

Rank 24: Scooters

"Integrate hydrogen scooters to mail distribution company."

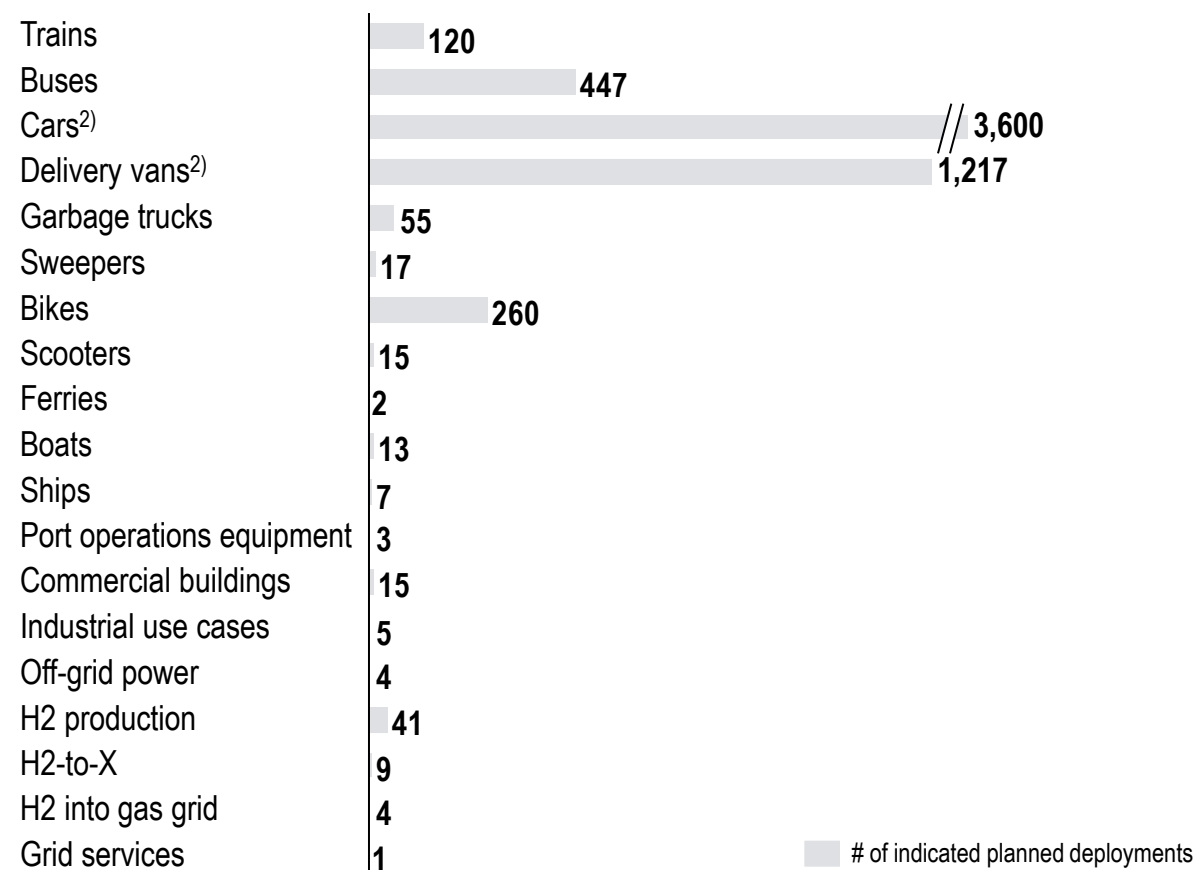
*"**Rental companies** with scooters in their fleet **have expressed their interest to invest in FC scooters**. This is part of the local action plan."*

1) Answers have been anonymised

Highest concrete indicative volumes for future application deployments is among top-ranked applications

1st ASSESSMENT –
PRELIMINARY

Indicative concrete deployment numbers for FCH applications in next 3 years¹⁾



- > First indicative figures from the survey suggest that top ranked applications also constitute the major near term market for hydrogen applications
- > The deployment perspective and specific use case for mobility applications is often more refined and concrete plans exist with participating Regions & Cities
- > Nevertheless, large deployment volumes concentrate on a very limited number of Region & Cities aiming at large-scale deployments
- > Ambitions to install hydrogen production capacities and develop adjunct services are spread across many individual Regions & Cities

1) Applications without any concrete deployment number not shown; deployment figures only included if specifically indicated, no interpretation of qualitative input

2) More than 50% of indicated deployments stem from one or two regions only

C. Project interim feedback discussion (end of Phase 1)

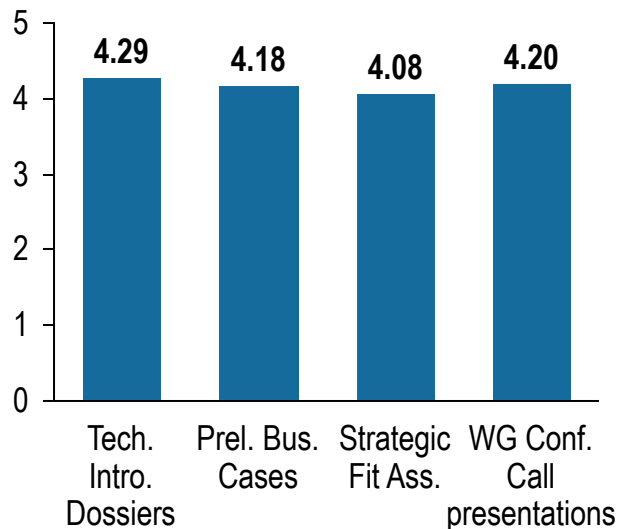


Overall, 2nd survey showed high level of satisfaction with analysis results in the project so far

Overview feedback Phase 1 from 2nd survey

Content

Question: "How satisfied are you with the content of the provided documents?" (n=48-51, averaged Likert-score)



Additional feedback

Question: "Any additional remarks regarding the project?" (selection)

"Keep up the good work!"

"Phase 1 has been useful however we would welcome a more regional/ locally focused insight into our specific areas of interest in our priority applications if they are selected for Phase 2"

"It would be interesting to have more in-depth analysis of the costs of each application"

" (...) business cases need to be realistic, consider all costs (...) and address competing technologies (e.g. not just looking at dirty diesel) from a neutral perspective - recognising where the best fit for HFC tech is alongside other tech and not simply delivering the industry pitch of HFC tech"

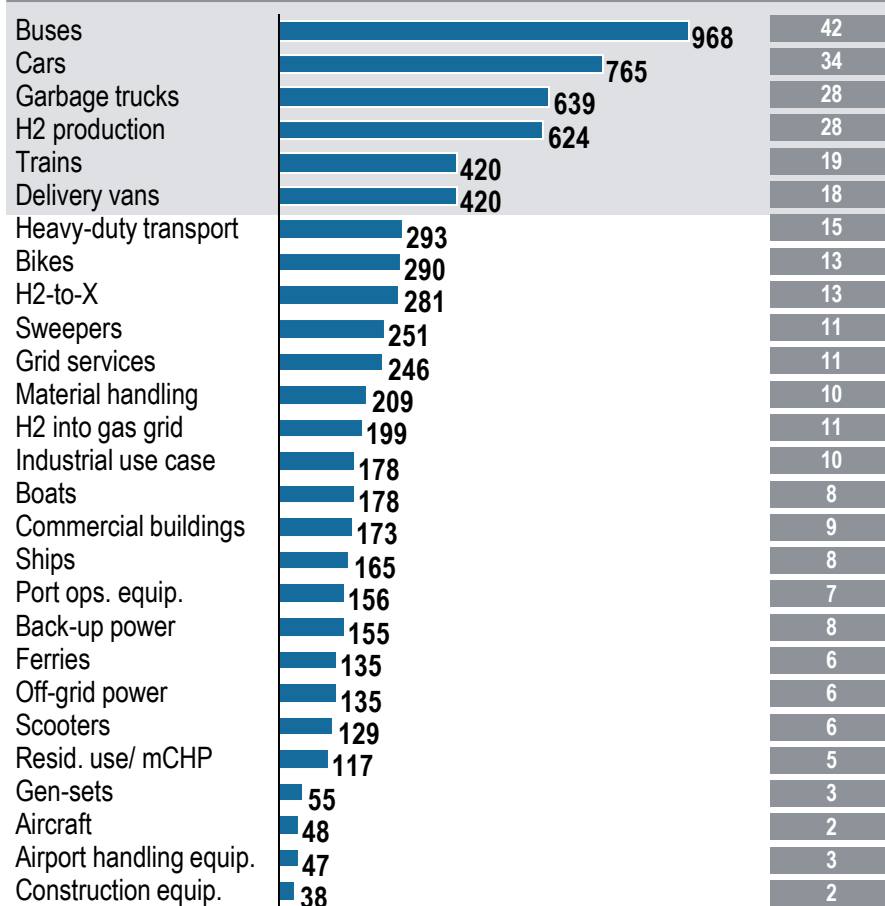
"Good initiative and I think it could lead to faster implementation of hydrogen in the end, but it has been hard to really get a good grip of the project so far"

D. Ranking of FCH applications for project focus in Phase 2

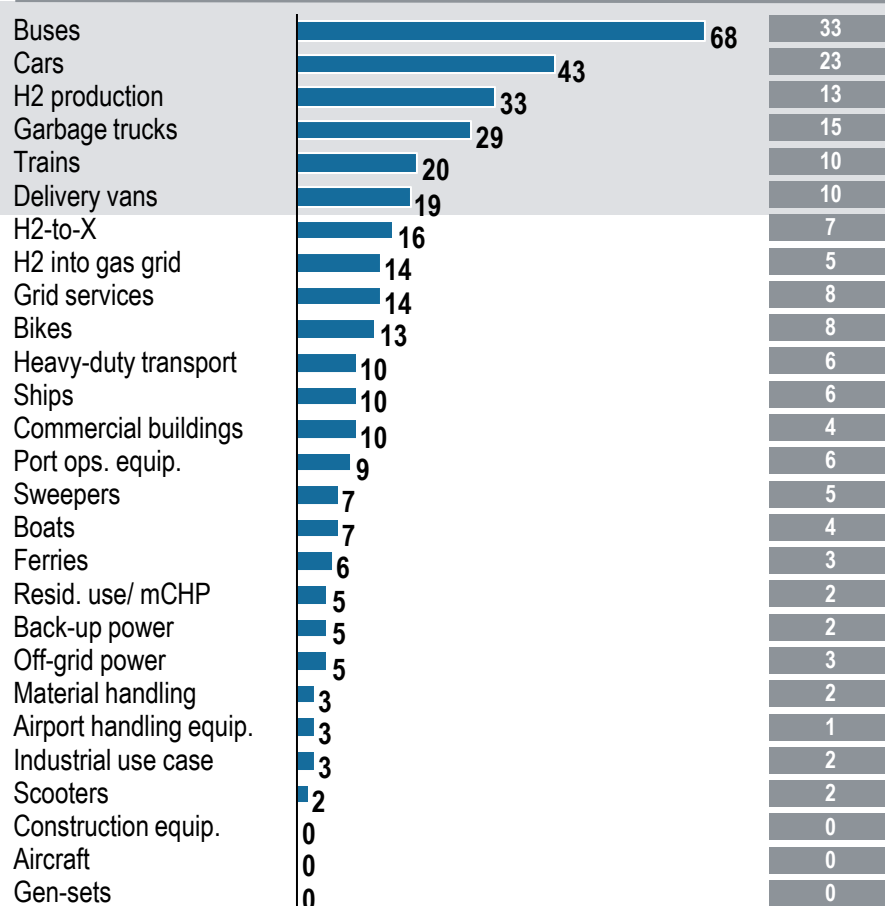


The top 6 applications remain the same in both, the bottom-up and top-down ranking, and indicate strong interest by the coalition

Results bottom-up ranking



Results top-down ranking



XX # of selections

Source: FCH2 JU, Roland Berger

The rankings show a clear focus, an interest in both high- and low-TRL applications and suggest different roles for Regions & Cities

Conclusions on the results of the rankings

- > The ranking results indicate a **clear focus on five mobility applications**; the top choices are more homogenous than it might be expected considering the 27 applications in scope of the project
- > The top-ranked applications have **both higher TRLs and lower TRLs**, suggesting: an interest and a need for Phase 2 to focus on concepts for both short term commercial deployments and demonstration projects for less mature applications – both will require different approaches in terms of project initiation (e.g. **"volume uptake" vs. "prototypes and their use cases"**)
- > Likewise, the top-ranked applications are associated with **different roles for regional/ municipal authorities**, both as more or less direct customers/ users (e.g. buses, trains, garbage trucks) and as enablers for private sector use (e.g. delivery vans, cars) – it is important to consider (1) the actual impact that the project coalition can have on the market and (2) how Regions and Cities can initiate such projects
- > There is **large interest in the coalition for H2 production and associated secondary applications** (e.g. grid services, H2-to-X) with a variety of indicated use cases – However, such cases should not be considered as stand-alone projects, but rather be understood as **a cross-cutting topic** where a clear offtake for the produced hydrogen is always required (e.g. as fuel for mobility applications)
- > In addition, we propose to include additional FCH applications in a "technology development platform" for Phase 2 which have a clear potential to become viable options for Regions & Cities in the medium to long term (to be discussed)

We propose an application framework for Phase 2 that comprises 5 top mobility applications and H2 production as cross-cutting topic

Application scope for Phase 2 based on consolidated ranking – Proposal for discussion

1 5 FCH mobility applications as focus for detailed business cases

- > Buses
- > Cars
- > Delivery vans
- > Garbage trucks
- > Trains



2 Selected further applications as focus for technology development dialog platform

- > Heavy-duty transport
- > Maritime applications
- > Commercial buildings



3 (Green) hydrogen production as cross-cutting topic for both consideration in detailed business cases as well as development of project concepts and roadmaps in Phase 2 of the project – for the latter also including a view on secondary applications (depending on interest in the coalition)

E. Break-out sessions in groups: Discussion and interpretation of survey results



The ranking of applications for Phase 2 will be based on evaluation provided by Regions & Cities in online survey and discussed today

Reminder: Ranking process of FCH applications for Phase 2

Bottom-up ranking by Regions & Cities via online survey:

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- > Local use case description

Consolidation of rankings

1. ...
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Discussion of final ranking of up to 10 applications for Phase 2 ...

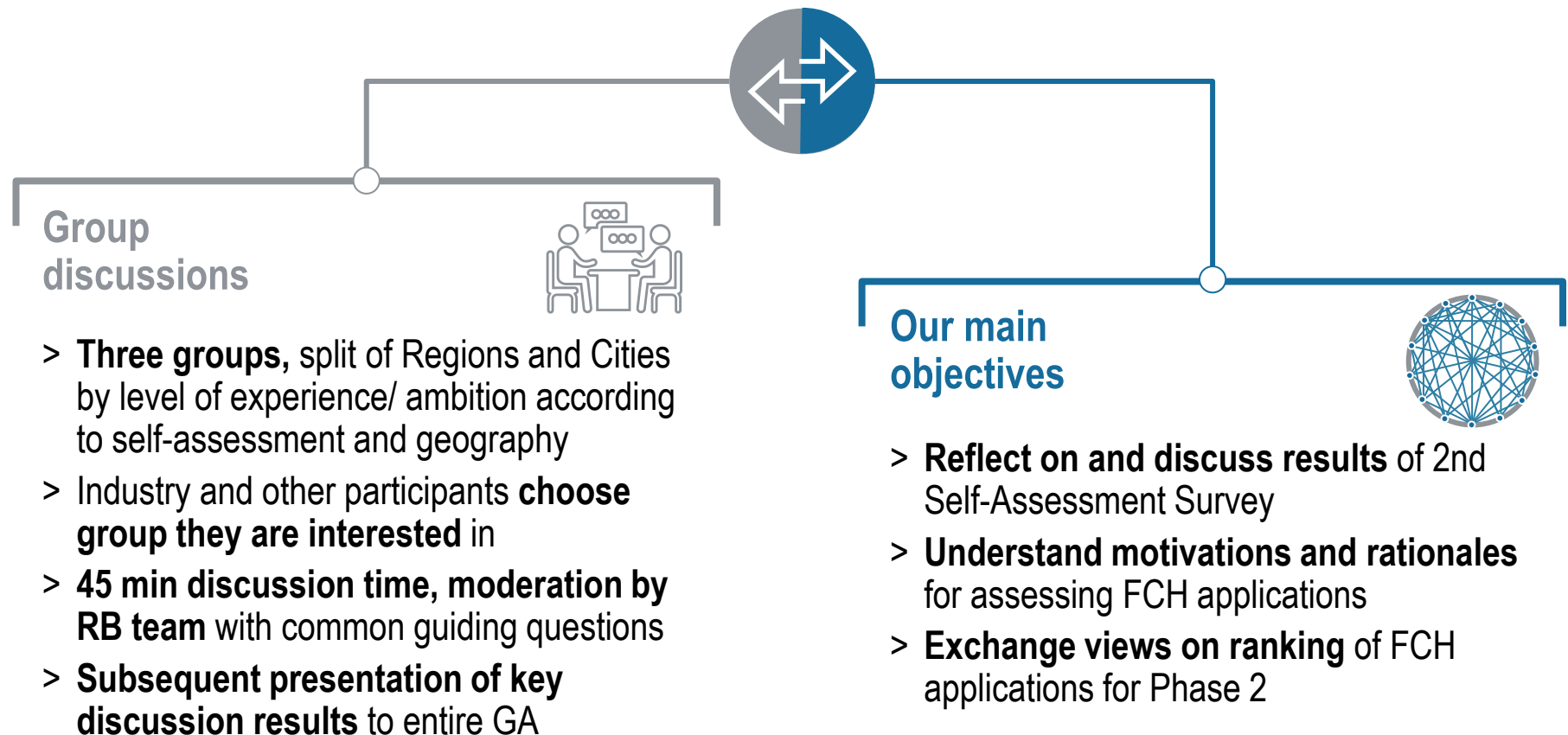
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... ..

... and final agreement in the GA today



In the next 45 min, we would like to discuss the preliminary results of the 2nd Self-Assessment Survey and ranking in small groups

Break-out sessions in smaller groups



We intend to discuss a set of general questions in all groups, looking at the outcome of the survey

Discussion

Key questions for break-out groups

1

Overall, how well does the **proposed ranking** reflect your preferences?

2

Which of the **dimensions of the bottom-up ranking** did you consider most important for assessing an FCH application right now?

3

Specifically, what was the **timeline** you had in mind? How important were **current technology readiness** and commercial availability for you?

4

How confident are you with regard to implementation of the **use cases** you specified in the top-down ranking?

5

Do you rather think about **next demonstration projects or commercial deployments**?



... plus any further questions you might want to discuss ...

The groups of Regions and Cities are based on previous FCH experience and ambitions as per the Self-Assessment Survey

Composition of break-out groups and moderators (RB team)

INDICATIVE

1) Tier 1: FCH Valleys

Cross-sector

E. Allinger-Csollich (AT)	S. Dumenieu (FR)
T. Andersen (DE)	B. Fournel (FR)
A. Arnaud (FR)	B. Jermer (DE)
M. Bechler (DE)	J. Jon (BE)
E. Bøe (NO)	Ø. Lunde (NO)
Y. Bodin (FR)	F. Pingault (FR)
H. Bouma (SE)	B. Rodriguez (UK)
K. Budden (UK)	E. Steenhuis (NL)
M. Cadic (FR)	T. Stromgren (NO)
F. Da Col (IT)	K. Van Bree (NL)
Dr. F. Koch (DE)	

2) Tier 2: 1st FCH projects

Regional Group 1

F. Barbir (HR)	L-B. Melinda (NL)
M. Bućan (HR)	D. Polovina (RS)
F. Cartasegna (IT)	M. Polovina (RS)
M. Deligiannakis (GR)	E. Stamatakis (GR)
A. Doucek (CZ)	T. Tonen (NL)
B. Krajnc (SL)	R. Turek (CZ)
M. Lewis (UK)	A. Venema (NL)
A. Martens (BE)	V. Willmann (BE)

3) Tier 2: 1st FCH projects

Regional Group 2

V. Álvarez Alhambra (ES)	S. Pedro (PT)
G. Ciudad García (ES)	O. Redondo (ES)
M. de Juan (ES)	L. Rubio Bremard (ES)
C. Funez Guerra (ES)	J. Sanz-Argent (ES)
R. Galarza Ruiz (ES)	J. Scholte (NL)
M. Nogueira (PT)	T. Ziero (FR)

Industry participants

Industry participants are invited to select one of the three groups to join the discussion



Markus Kaufmann



Dr. Martin Robinus



Dr. Simon Lange



Yvonne Ruf



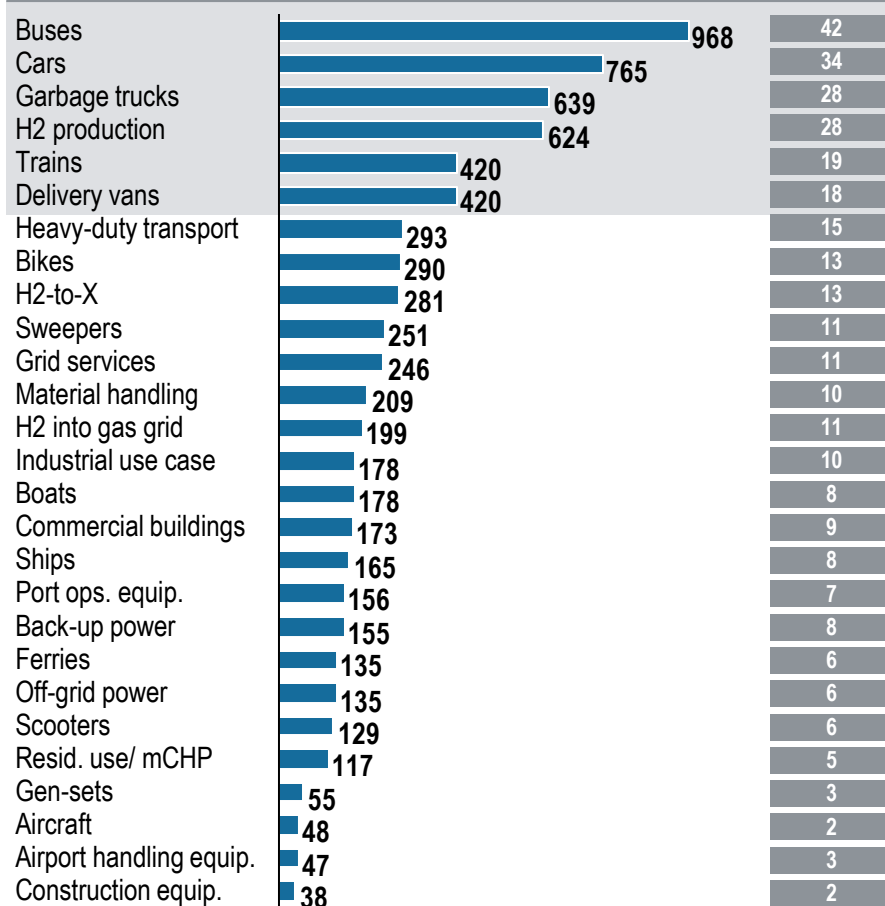
Felix Heieck

F. Final discussion and agreement on applications ranking for Phase 2

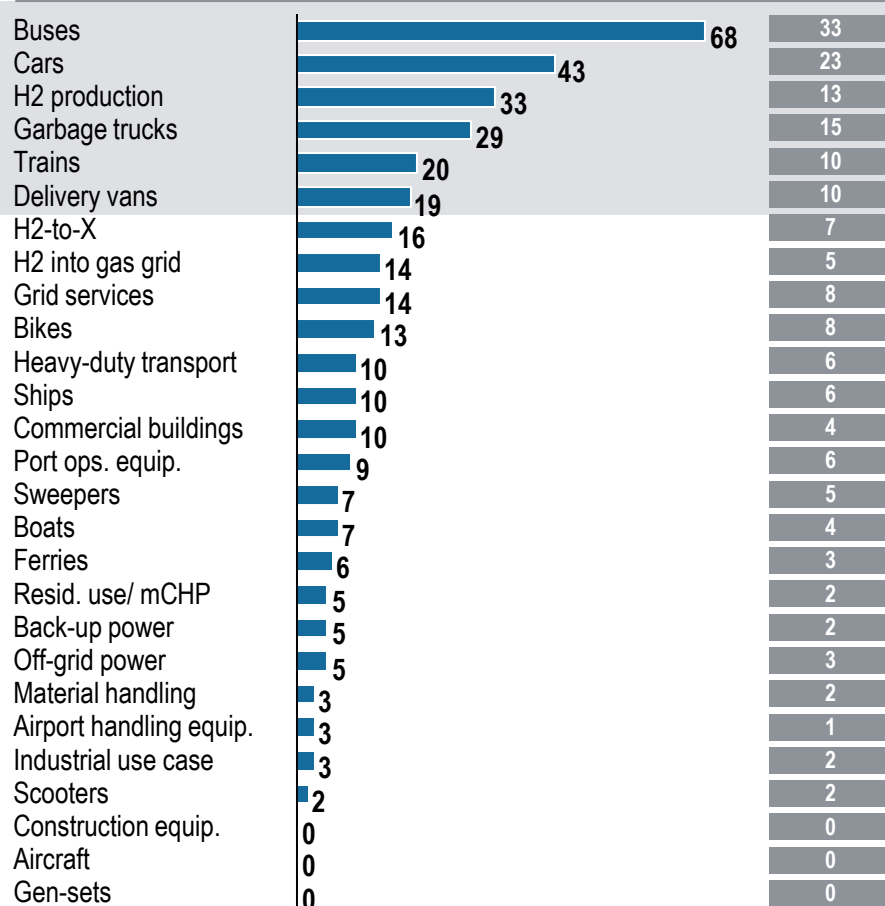


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G. General project scope, approach and orga- nisation for Phase 2

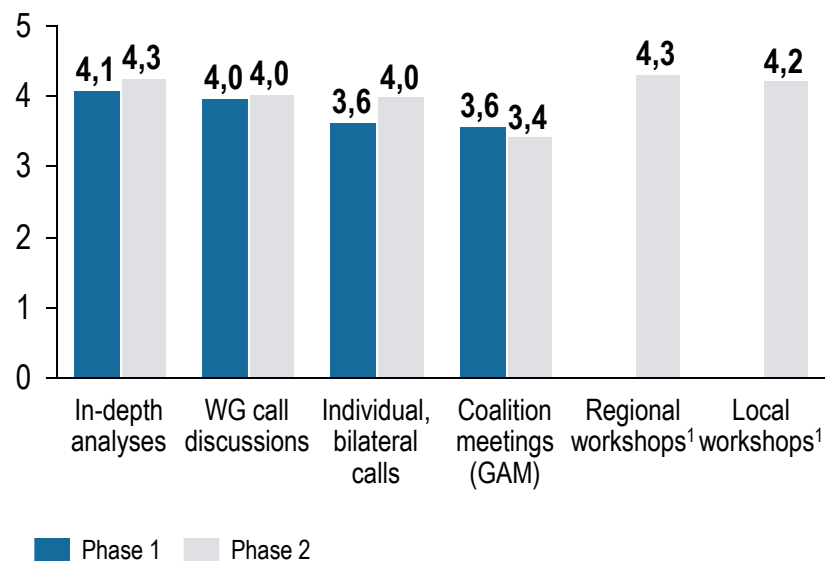


Based on the feedback given in the 2nd survey, the coalition wishes for more decentralised workshop formats and focused discussions

Overview input regarding Phase 2 from 2nd survey

Interaction Formats

Question: "Which of the following interaction formats between you and the FCH / Roland Berger suit your local needs best?" (n=49-54, averaged Likert-score)



1) This formats where not (or very limited) used during Phase 1 of the project

Additional feedback

Question: "How could the overall communication in the project be improved? (selection)"

Between RB & coalition: "Some way of understanding who is on line - not always easy to understand who is speaking. Also might be helpful to split sessions over 2 adjacent days or even weeks (although understand drawbacks) to allow better availability of participants?"

Between RB & coalition: "Presentation of study at relevant conferences in regions"

Within coalition: "GA in different countries not only in Brussels in order to facilitate the assistance and promote the interaction between members"

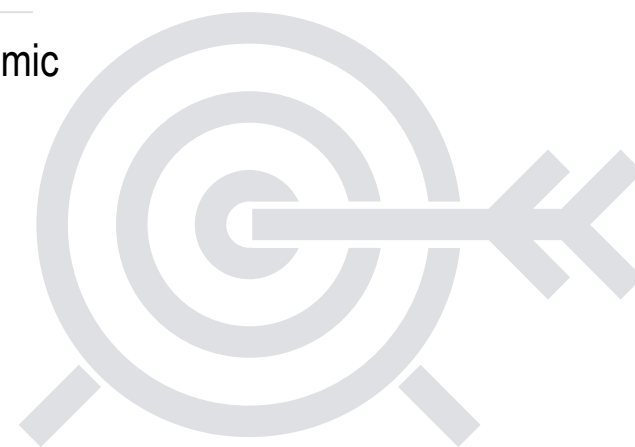
Between coalition & industry: "Collective order agreement with a manufacturer for a specific product could be an interesting way to make HRS deployment concrete"

Between coalition & industry: "Create topic specific clusters for interaction between interested regions (like FCH JU FC bus procurement clusters)"

We see six overarching objectives for Phase 2 and the project overall, especially project initiation and market intelligence

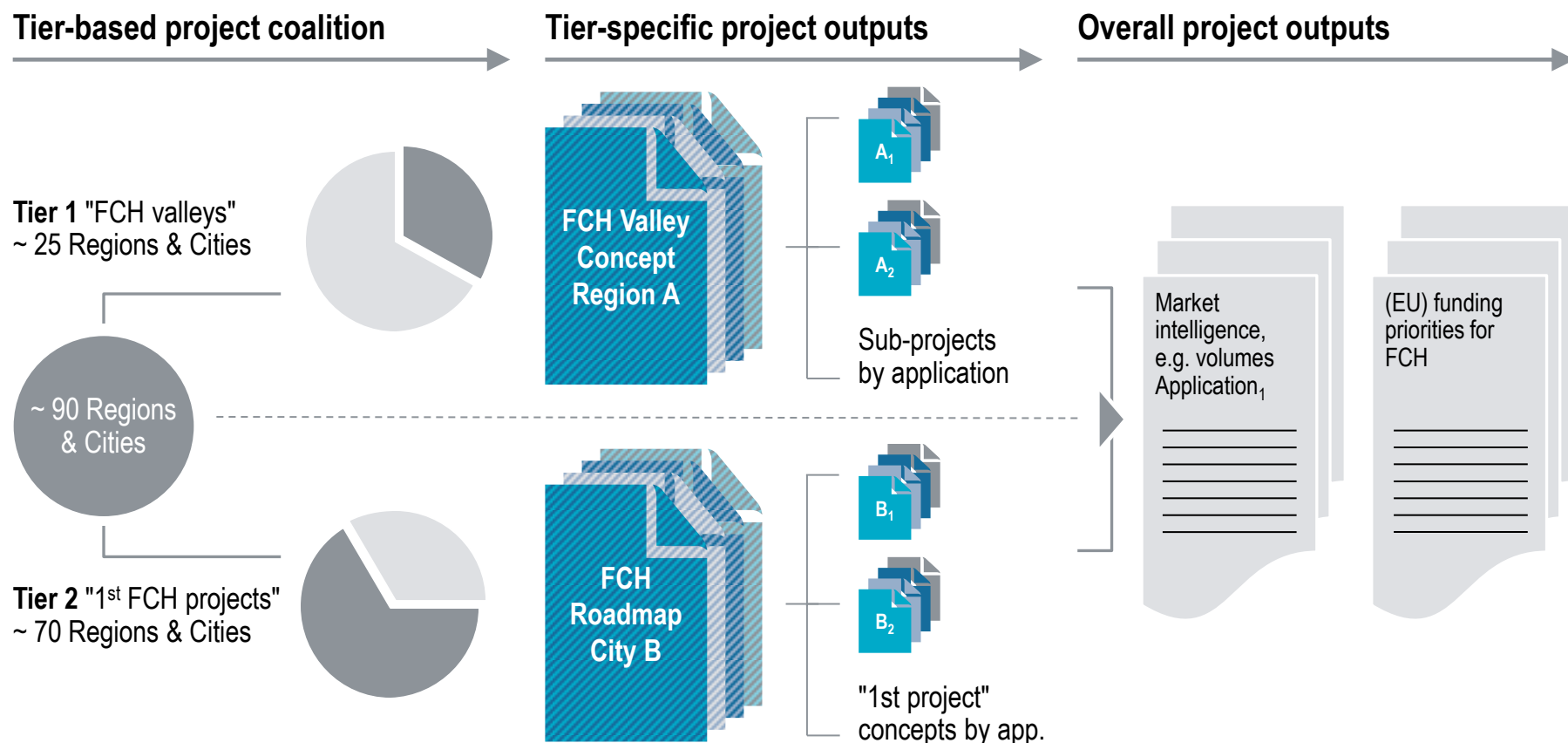
Main objectives of Phase 2 and the project overall – in order of importance

- 1 Develop FCH roadmaps and project concepts to broaden the reach of FCH deployments in Europe, support the initiation of specific FCH projects
- 2 Systematically gather market intelligence from bottom up, e.g. aggregate indicative demand volumes, refine product requirements, specify focus areas for technology development
- 3 Identify and scope funding needs and specific requirements of European Regions & Cities as input for the remainder of FCH2 JU and a potential follow-up
- 4 Create awareness for and promote local environmental and economic benefits of FCH applications, esp. to local policy makers
- 5 Foster the technical, commercial and otherwise understanding of key FCH applications among Regions & Cities
- 6 Explore further joint procurement initiatives similar to the current efforts with FCH buses



The coalition will be divided in 2 tiers – Target outputs are valley concepts, roadmaps and project ideas, market/funding intelligence

Target outputs of Phase 2 and the project overall



Regions & Cities develop, RB facilitates & supports in the process, FCH industry assists with experience and expertise

Valley concepts will focus on building local H2 eco-systems – FCH roadmaps will develop individual deployment projects

Deep-dive on example outlines for tier-specific outputs



FCH Valley Concepts

- > Background, starting point for the valley
- > Overarching objectives and expected benefits from FCH valleys
 - Economic (jobs, innovation, investment, etc.)
 - Environmental (GGE, Nox, noise, etc.)
- > Identified synergies and business case levers in valley architecture
- > New business models for hydrogen valleys
- > Necessary stakeholder alignment process
- > Prioritised project list
- > Target funding and financing concept
- > Roles and responsibilities for roadmap implementation
- > Next steps
- > ...

FCH Roadmaps

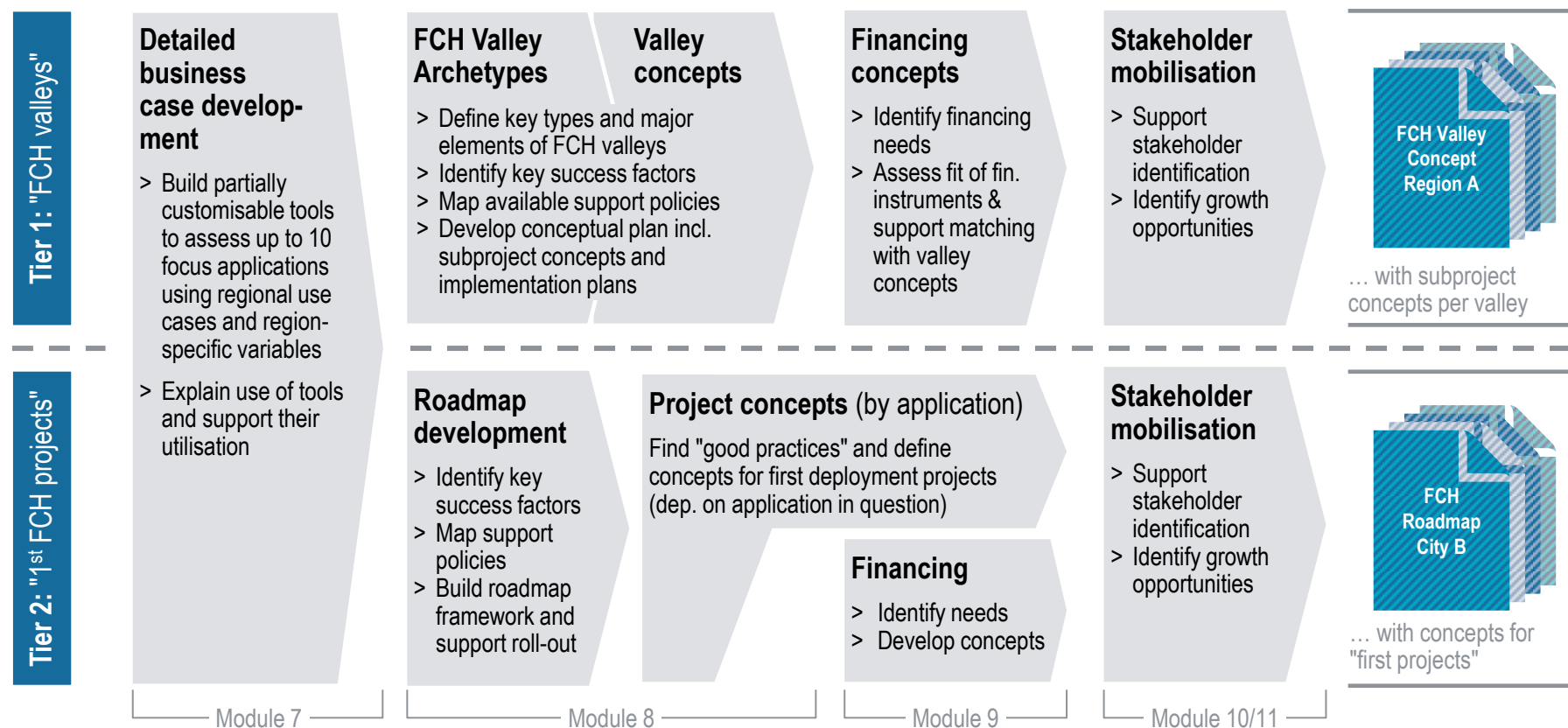


- > Background, starting point in the Region
- > Overarching objectives and expected benefits from FCH deployments
 - Economic (jobs, innovation, investment, etc.)
 - Environmental (GGE, Nox, noise, etc.)
- > Stakeholder mapping
- > Short-, medium- and long-term targets for deployment and key activities
- > Prioritised project list
- > Target funding and financing sources
- > Roles and responsibilities for roadmap implementation
- > Next steps
- > ...

To cater to different needs, the project program in Phase 2 should be tier-specific, with an initial joint phase on detailed business cases

Overall project program for Phase 2

Draft

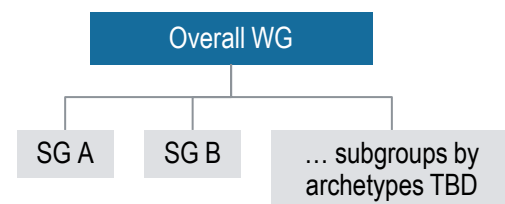


We propose a flexible, two-layered working structure within Tier 1 and Tier 2 to keep the number of Working Groups manageable

Project organisation and interaction mode (conf. calls, pers. meetings)

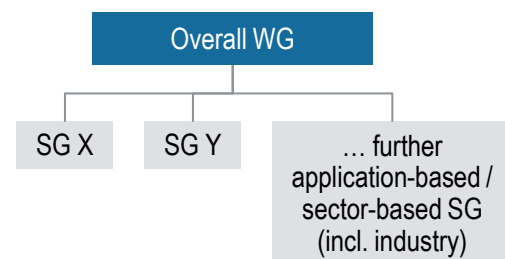
Tiers of Regions & Cities

"FCH valleys" (Tier 1)



... industry participates based on interest in valley archetypes

"1st FCH projects" (Tier 2)



General organisation

Overall (conceptual) WG: Regular conference calls (interval TBD), 2-3 personal meetings of all working group participants¹⁾

Subgroups TBD – Possibly by valley archetype or selected focus topics to be agreed upon in WG: Selected calls and joint discussion in personal meetings

Overall (conceptual) WG: Regular conference calls (interval TBD) and personal meetings to advance projects in regional base (10-12)¹⁾

Subgroups TBD – Possibly by applications/ sectors: selected focus calls and consideration in personal meetings depending on local preferences

Role Roland Berger

> Prepare concepts (e.g. valley archetypes), tools
> Lead WG conf. calls, prepare meetings

> Lead subgroup conference calls
> Prepare input with regions and industry

> Prepare conceptual/ functional inputs (frameworks, check-lists)
> Lead WG-Calls

> Lead subgroup calls
> Co-organise meetings to advance typical types of first projects

Role WG (esp. leaders)

> Support preparation of concepts/tools
> Feedback, participation, co-moderation

> Co-lead subgroup calls
> Give input on focus topics, questions to be discussed and specific ideas

> Support preparation of concepts/tools
> Feedback, participation, co-moderation

> Co-lead subgroup calls
> Co-organise meetings to advance typical types of first projects

1) Given the available project time and planned GA meetings in Brussels, we aim for approx. 15 (max. 20) additional personal project meetings throughout Phase 2

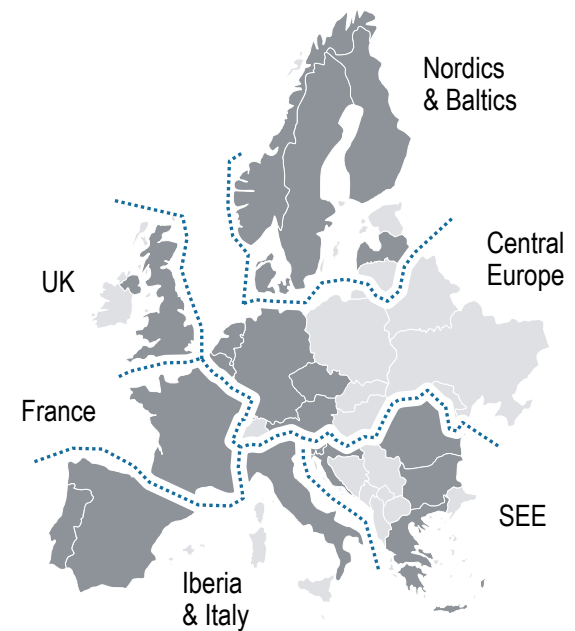
Regional meetings should focus on Tier 2 locations requiring local support with stakeholder mobilisation and project development

Regional in-person meetings for Tier 2

Basic meeting concept

- > **Key audience:** Tier 2 locations looking to implement first FCH projects¹⁾
- > **Format:** 0.5-1 day (enlarged) roundtable, up to 30 participants
- > **Scope and focus:** bundling Regions & Cities geographically and covering several applications in one meeting
- > **Main objectives:**
 - Help mobilise support from key stakeholders and secure political buy-in at the local (and national) level
 - Facilitate development of local FCH deployment projects
- > **Key activities and inputs:**
 - Raise awareness for FCH benefits overall, showcase best practices for first FCH projects
 - Explain key funding and financing opportunities
 - Give framework for project development
- > **Co-organisation by local host (WG member) and RB**

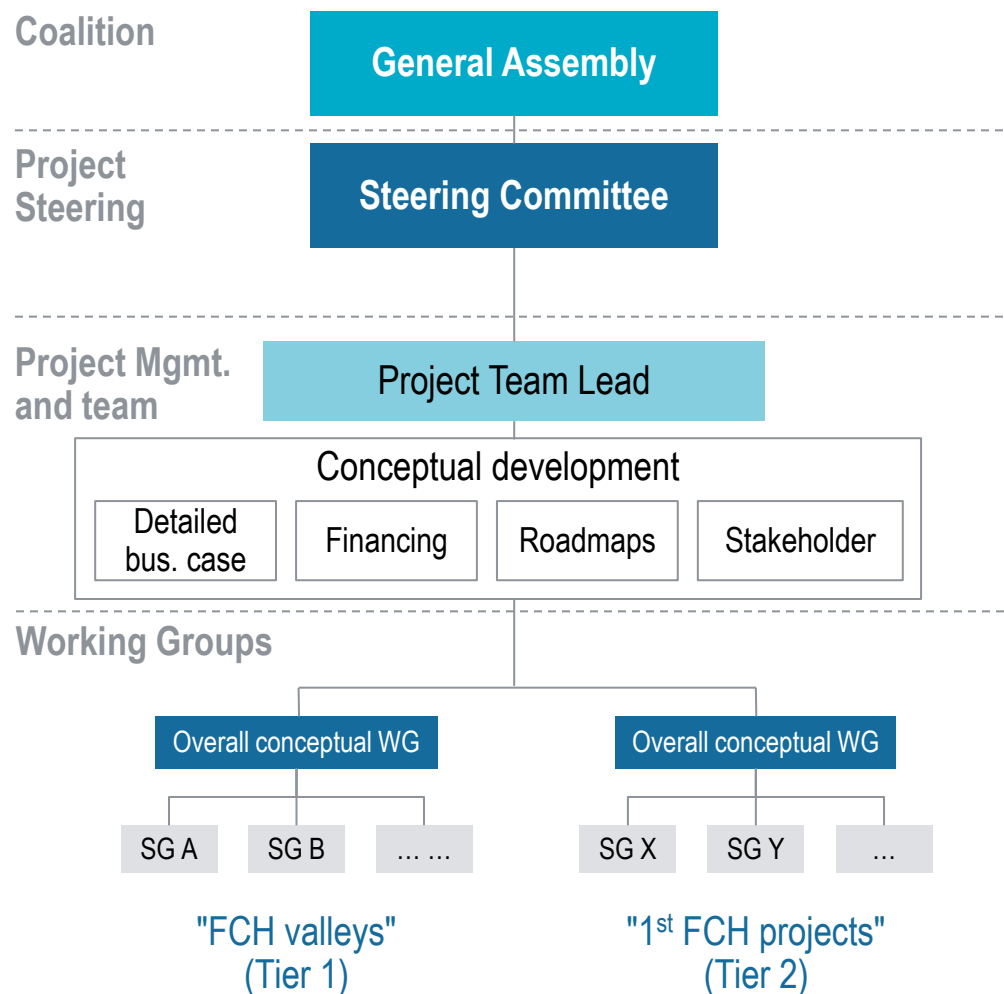
Meetings to be organised for each of the six indicative geographical clusters:



■ Countries represented in the Coalition

¹⁾ Tier 1 should have a few "working meetings" (regardless of geography) to develop the valley concepts further (2-3 in total)

Overall, we thus suggest a project organisation throughout Phase 2 based on four levels: GA, SteerCo, Project Mgmt., WGs



General Assembly

- > Fundamental decisions/stakeholder involvement

Steering Committee

- > Coalition repr./working group chairs/FCH JU
- > Overall project steering, frequent decisions

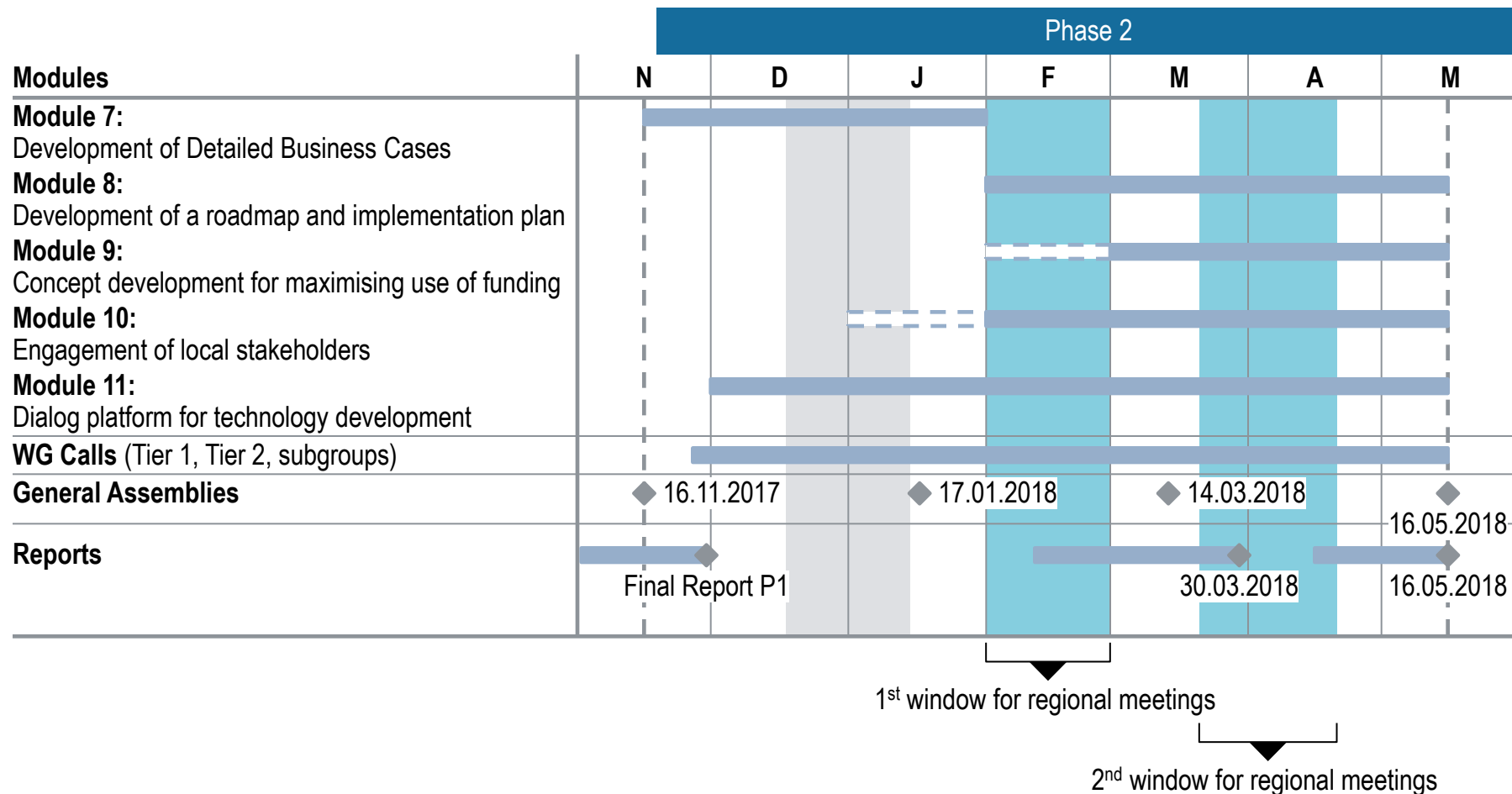
Project Management and Team

- > Operational project work
- > Conceptual preparations for working groups, e.g. to prepare frameworks, templates etc.
- > Close cooperation with working groups

Working Groups

- > Integrated teams to elaborate functional framework for FCH valleys or individual projects
- > Guiding, inputting and reviewing analytic work regarding the different aspects of the project
- > Facilitating regional or application-specific meetings

Updated project plan for Phase 2 – More detailed plan for calls and meetings to be developed after formation of WGs



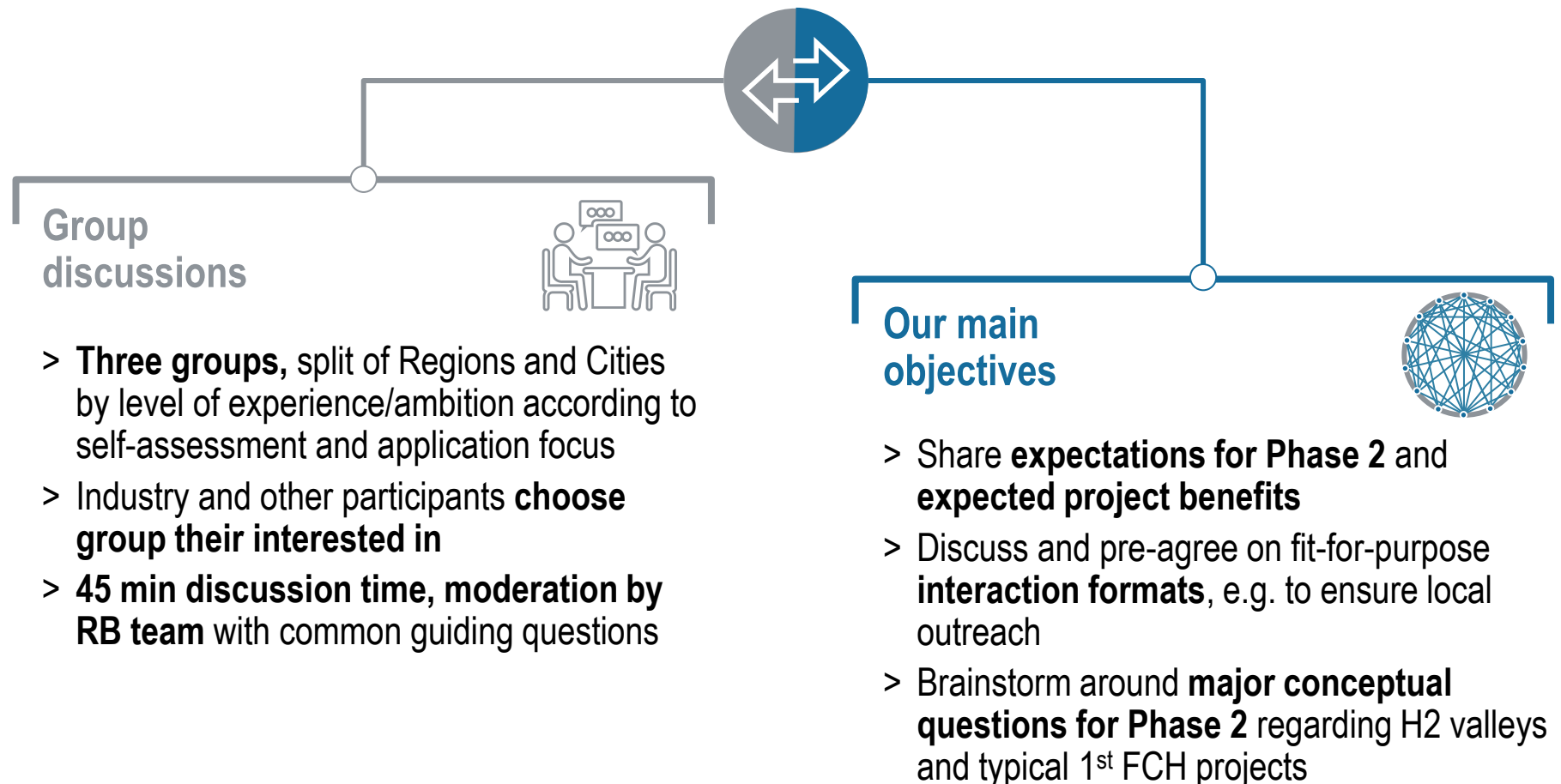
■ Holiday season ■ Main windows for regional meetings

H. Break-out sessions in groups: discussion and input regarding Phase 2



In the next 45 min, we would like to discuss the upcoming Phase 2 of the project in small groups

Break-out sessions in smaller groups



Focus of each break-out group is slightly different, with specific topics depending on experience/ambition and application

Detailed focus topics of break-out groups

Tier 1: FCH Valleys *Cross-sector*

- > How would you **cluster the FCH valleys**? What could be FCH valley **archetypes**? Around which use cases/industrial policies?
- > What kind of **interaction format** do you deem suitable to advance the valley discussion for you? How can we maximise the potential of the valley group for you?

Tier 2: 1st FCH project *Regional Group 1*

- > What are the main **challenges** for getting 1st FCH projects of the ground?
- > What type of **interaction/ communication format** do you prefer? Which types of **events** would be useful for you?
- > **What role could industry play** in helping to advance first projects in Phase 2?
- > What kind of **specific input/ material** do you deem suitable to help you realise first FCH projects?

Tier 2: 1st FCH project *Regional Group 2*

The groups of Regions and Cities are based on previous FCH experience and ambitions as per the Self-Assessment Survey

Composition of break-out groups and moderators (RB team)

INDICATIVE

1) Tier 1: FCH Valleys

Cross-sector

E. Allinger-Csollich (AT)	S. Dumenieu (FR)
T. Andersen (DE)	B. Fournel (FR)
A. Arnaud (FR)	B. Jermer (DE)
M. Bechler (DE)	J. Jon (BE)
E. Bøe (NO)	Ø. Lunde (NO)
Y. Bodin (FR)	F. Pingault (FR)
H. Bouma (SE)	B. Rodriguez (UK)
K. Budden (UK)	E. Steenhuis (NL)
M. Cadic (FR)	T. Stromgren (NO)
F. Da Col (IT)	K. Van Bree (NL)
Dr. F. Koch (DE)	

2) Tier 2: 1st FCH projects

Regional Group 1

F. Barbir (HR)	L-B. Melinda (NL)
M. Bućan (HR)	D. Polovina (RS)
F. Cartasegna (IT)	M. Polovina (RS)
M. Deligiannakis (GR)	E. Stamatakis (GR)
A. Doucek (CZ)	T. Tonen (NL)
B. Krajnc (SL)	R. Turek (CZ)
M. Lewis (UK)	A. Venema (NL)
A. Martens (BE)	V. Willmann (BE)

3) Tier 2: 1st FCH projects

Regional Group 2

V. Álvarez Alhambra (ES)	S. Pedro (PT)
G. Ciudad García (ES)	O. Redondo (ES)
M. de Juan (ES)	L. Rubio Bremard (ES)
C. Funez Guerra (ES)	J. Sanz-Argent (ES)
R. Galarza Ruiz (ES)	J. Scholte (NL)
M. Nogueira (PT)	T. Ziero (FR)

Industry participants

Industry participants are invited to select one of the three groups to join the discussion



Markus Kaufmann



Dr. Martin Robinus



Dr. Simon Lange

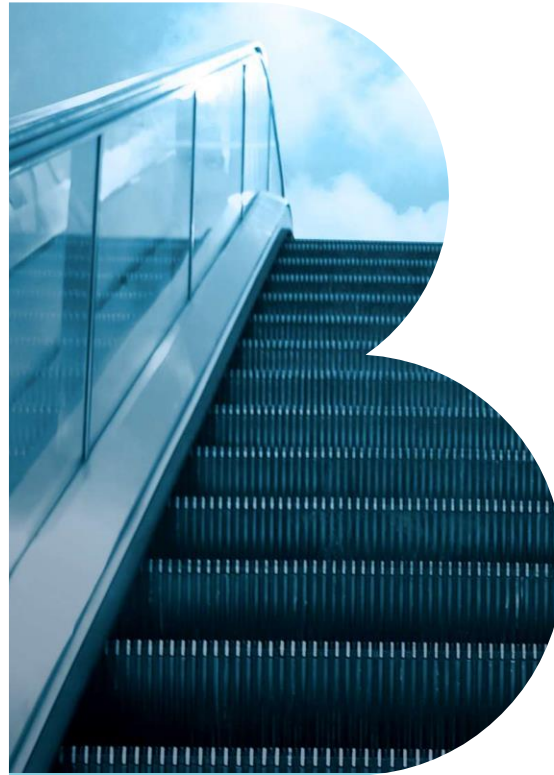


Yvonne Ruf



Felix Heieck

I. Conclusion and next steps



Next steps



Key activities:

- > Incorporation of feedback (esp. from dial-in participants) and joint conclusions into GAM presentation, subsequent distribution to all project participants
- > Start of Funding and Financing Navigation Tool test phase & finalisation
- > Initiation of Detailed Business Case analyses

Upcoming events:

- > 10th Stakeholder Forum FCH2 JU, 22 November 2017
- > Detailed Business Cases Working Group Call, tbd
- > **5th and next GAM: Wednesday, 17 January 2018**

Please do not hesitate to get in touch with us

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Roland
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navigating
complexity