ALADIN status overview

Piet Termonia

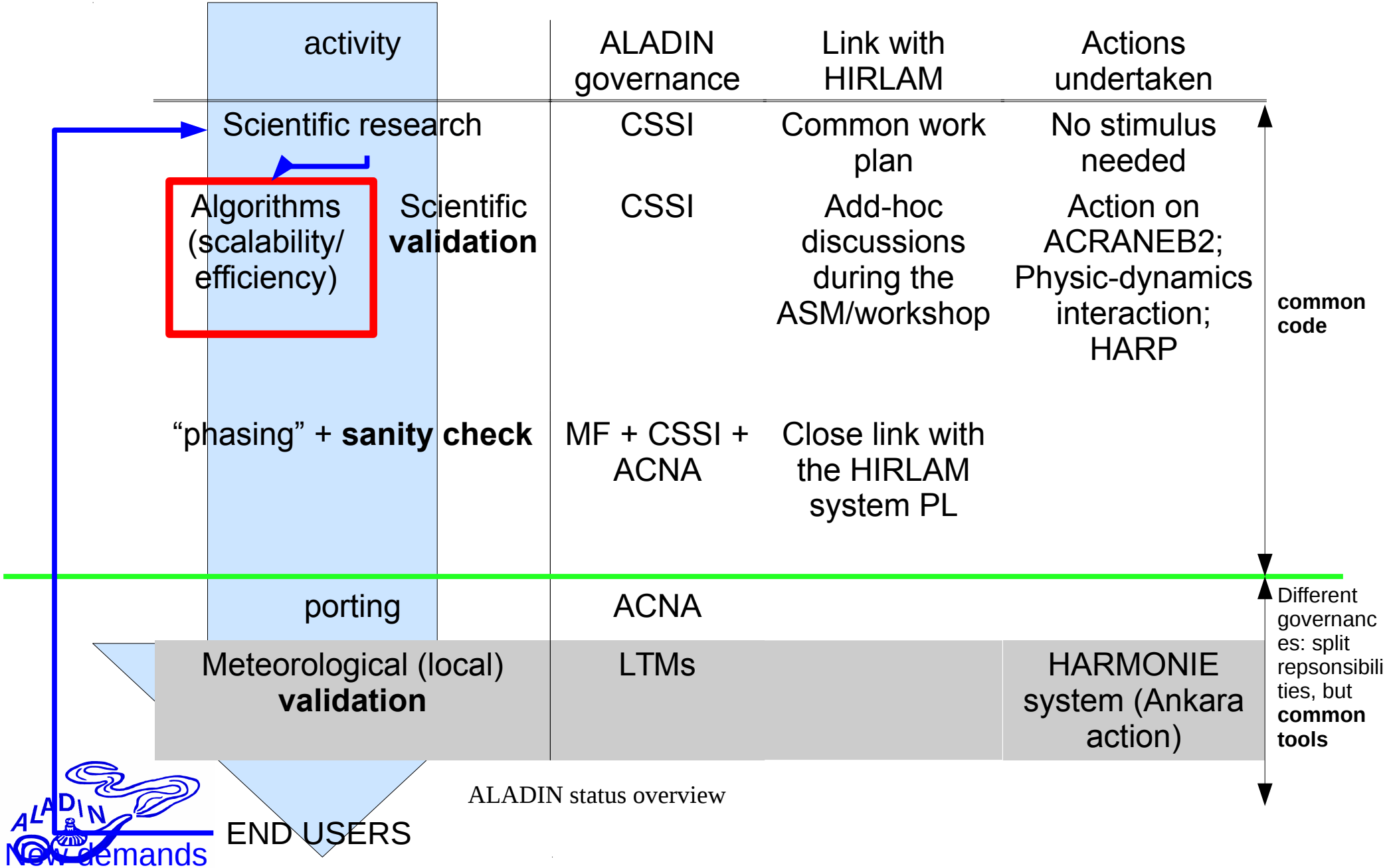
ALADIN workshop/HIRLAM ASM

13/4/2015

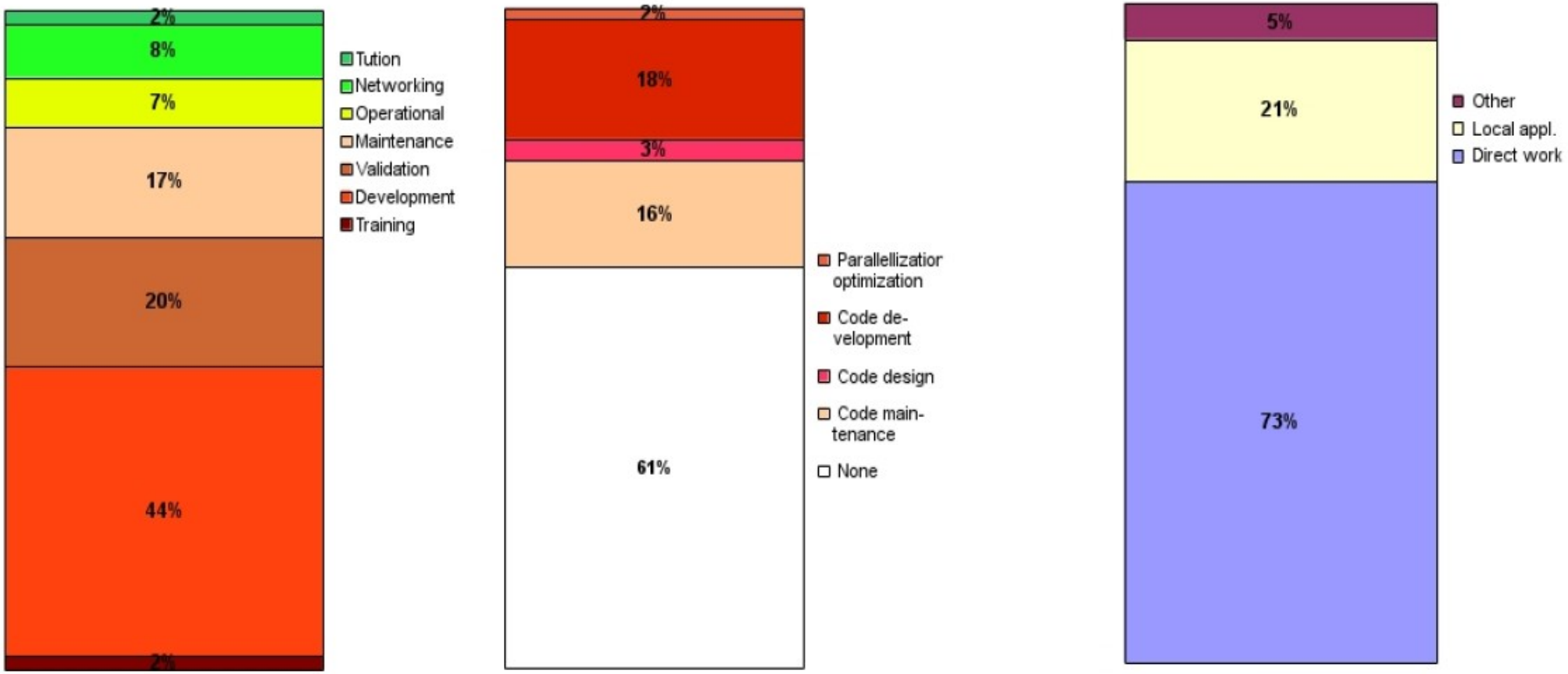
Merge: (short) historical review

- 2013, ALADIN General Assembly:
  - **How to organize a cooperation of 26 countries?**
  - Decided not to go for a merge at the next MoUs, but make preparations
  - Input from LACE.
- Meeting in Brussels (14/2/2014) by the Task Force
- Analysis of LACE included, new document presented to PAC
- Synthesized in the **“Science to operations” diagram**: accepted by PAC. PAC asked for a **road map**.
- Presented to the HIRLAM Council this summer: positive response
- Presented to HIRLAM Advisory Committee in November
- Several actions were taken to test the feasibility of the proposals (physics-dynamics action, HARMONIE WW, Forecasters meeting)
- **Common ALADIN General Assembly/HIRLAM Council (2/12/2014) + Declaration**
- ***The 2 MoUs of both ALADIN and HIRLAM have to be renewed at the end of this year.***

From science to operations summarized on 1 sheet



Type of work realised (manpower between January 2012 and June 2014)



An unofficial strongly needed activitiy: ***code architecture***

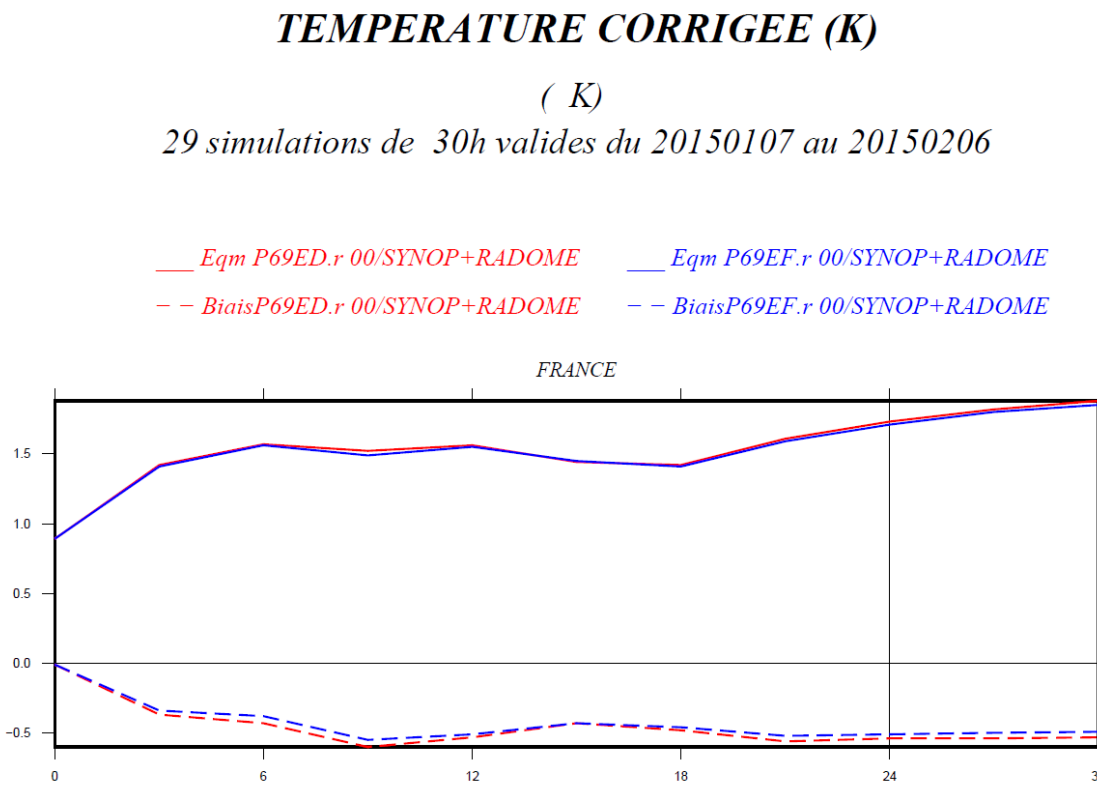
- Last year in Reykjavik there was a question: *what model are we running?* AROME, ALARO …
- This led to a dedicated action.
- First “deliverable”: ACRANEB2 is phased to the AROME configuration (as requested by HMG last year in Reykjavik) by Jan Masek. The exercise for radiation is relatively easy compared to the “moist” part, BUT the “methodology” (stepwise approach, follow-up meetings with webconfs, meeting in Toulouse, care of cycles) works so far. Next step: turbulence
- Evolve towards a “WRF-ish” **H**ARMONIE **F**orecast **S**ystem (**HFS**)?
- This is also a **scientific testbed!**

Synthetic time table:

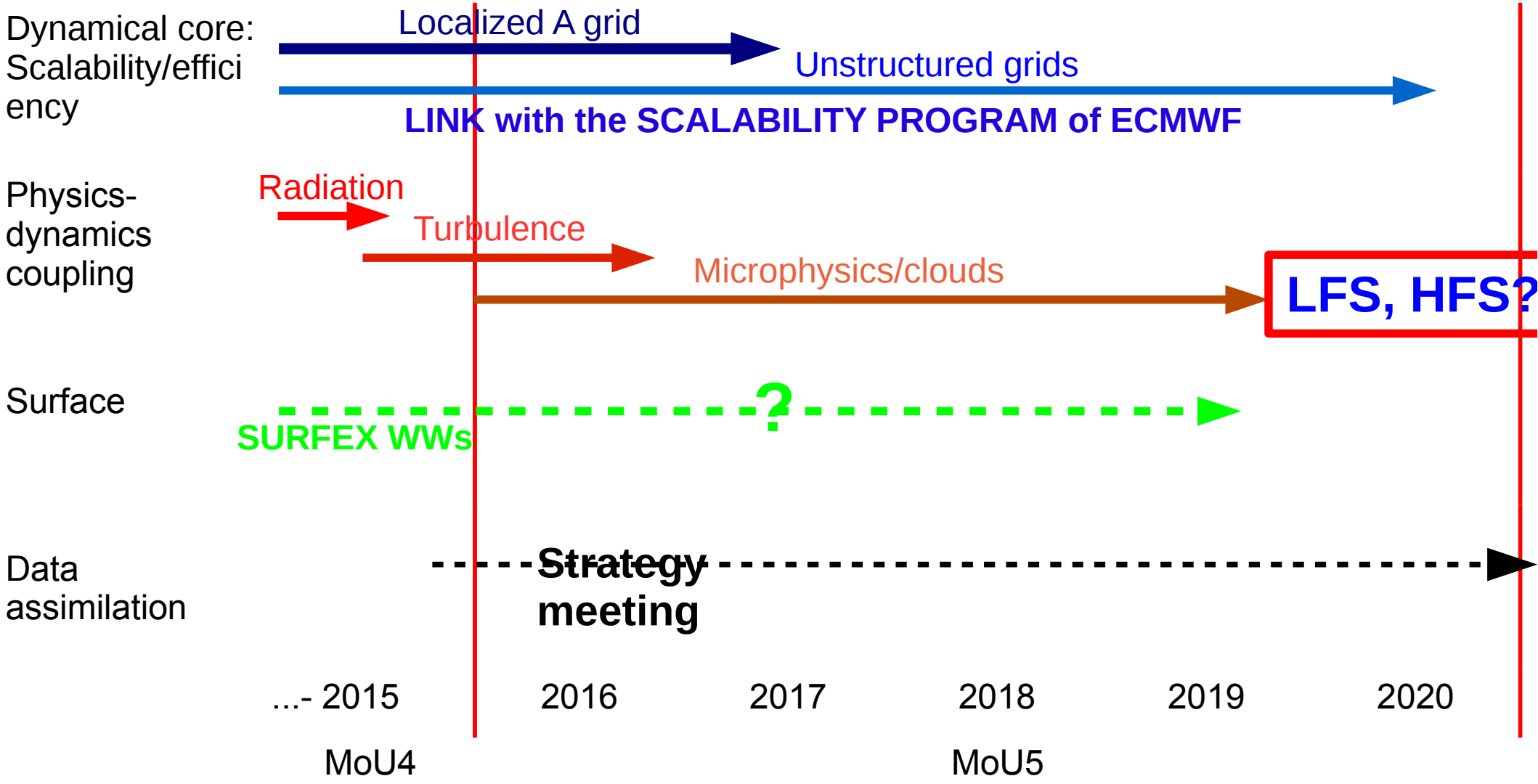
	Calendar (months/meetings)										
	2013							2014			
	5-6	WW Brussels (24-28/6)	7-9	CSSI/HMG (video)meeting	10-11	General Assembly (14-15/11)	12	1-4	ALADIN workshop/ ASM	4-5	PAC/ HAC
Action 1 : CPTEND_FLEX											
Action 2 : r vs. q, T vs. theta											
Discuss analysis of action 2											
Action 3 : Cleaning of APLPAR											
Action 4 : Redesign of APL_AROME, APLPAR											
Report progress to GA about action 1 to 3.											
ALADIN WS/HIRLAM ASM : present analysis of action 4											
PAC/HAC : provide advice on the scenario's of action 4											

Status physics-dynamics action

- The interface has been tested in AROME (Courtesy Y. Seity) and gives neutral scores
- Turbulence can be “externalized” (D. Degrauwe and I. Bastak).



ALADIN PAC: roadmap needed for the code development to be concretized at the next ALADIN GA(/HIRLAM Council)



Recognizing the capabilities and achievements of the NMHS belonging to Aladin and Hirlam consortia:

1. The NMHS present at the joint Aladin-Hirlam meeting (dec 2, 2014) share the same objective to jointly develop and maintain the best possible skilled limited area weather forecasting system, building on the developments of the IFS/Arpege global forecast system and on the Aladin and Hirlam limited area systems. This limited area system is defined as a set of data pre-processing, data assimilation, atmospheric model and postprocessing tools for producing the best possible operational mesoscale weather forecasts.

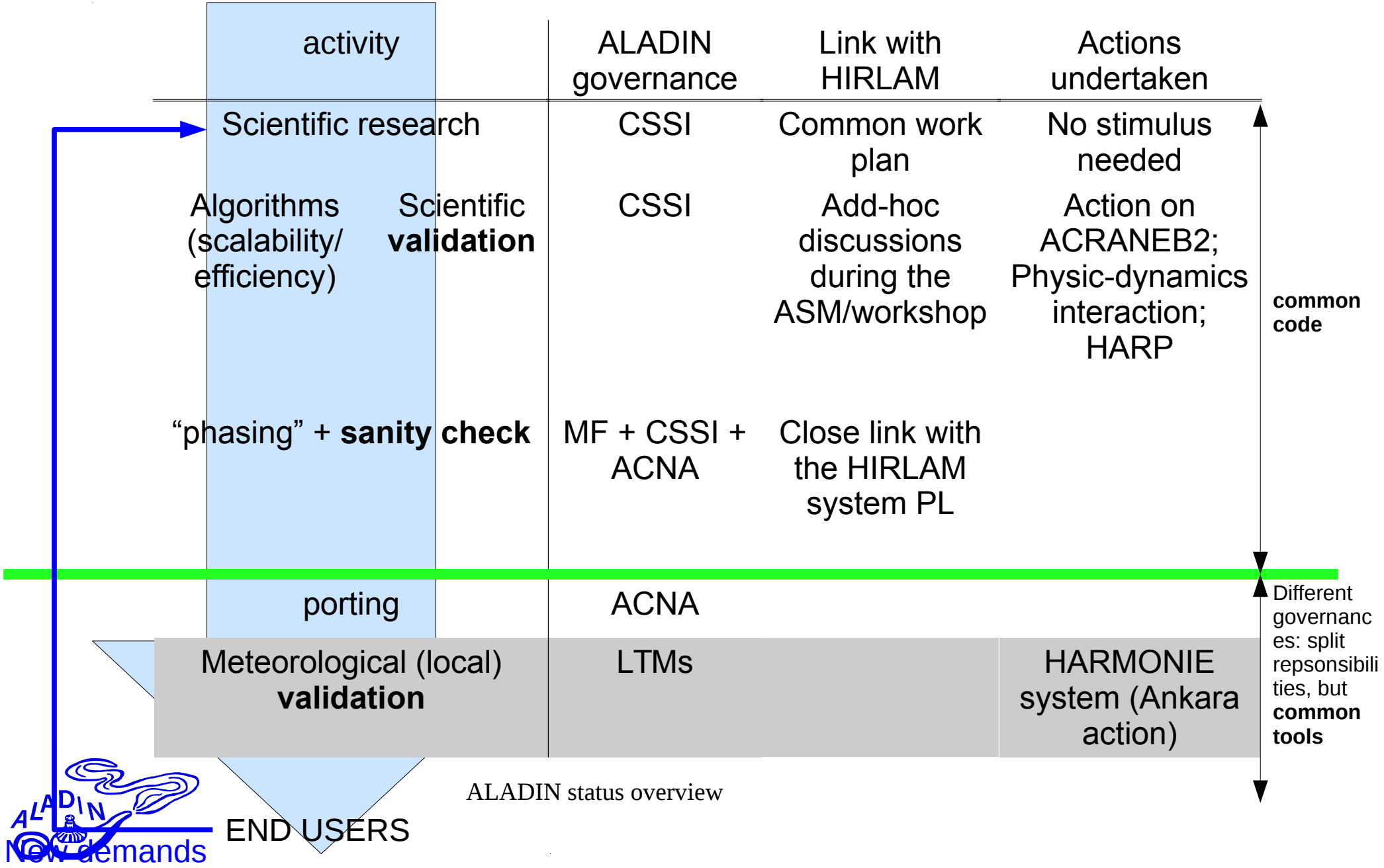
2. Aladin and Hirlam consortia will work together with the aim of forming one single consortium by the end of the 2016-2020 MoUs. To this aim, the following issues have to be resolved:
- code ownership (software IPR) : current situation and suitable evolutions. In particular advantages vs drawbacks of open source solutions should be assessed;
- data policy (access to model outputs) ; to this aim a map of the various current operational configurations of the limited area system should be produced and scenarios for data dissemination should be assessed;
- global picture of annual contribution of countries to the various types of activities (from fundamental research to code implementation);
- identification of common activities and specific activities (possibility of core and optional programs);
- branding (including suitable evolution of the name of the system).

3. Human resources to support the work will be identified.

4. Both PM will report every six months on those issues to the consortia governing bodies.

5. Joint meeting of governing bodies of both consortia will be held at least once a year.

From science to operations summarized on 1 sheet



The MoU(s)

Definitions on code (current ALADIN MoU)

4. The following definitions are used in this MoU:

i. The ALADIN System is defined as the set of pre-processing, data assimilation, model and postprocessing/verification software codes, tools and data shared by all Members and available to each Member and acceding Member for producing and using the best possible operational mesoscale forecasts based on a configuration compatible with its available resources.

ii. The ALADIN System is composed of shared software codes of three different types:

- *the ALADIN Common Codes, defined as the codes jointly developed and maintained by the Members and the ALADIN acceding Members referred to in Article 3;*
- *the ALADIN Co-owned Codes defined as the codes jointly developed and maintained with other consortia or partners and co-owned by the Members and these consortia or partners (e.g. the Common ALADIN-HIRLAM Code);*
- *the ALADIN Shared Third-Party Codes contributed and owned by partners, other consortia or third parties who have granted appropriate rights to the Members for the use of such codes for the implementation of this MoU.*

iii. A Version of the ALADIN System is any release of the ALADIN System present in the ALADIN code repository for research and development including operational purposes, or any subset of code anticipated to become part of the Common Codes.

iv. A Configuration of the ALADIN System is a subset of ALADIN Codes used by a Member or acceding Member for its own implementation.

Agreement with HIRLAM

The shared ALADIN-HIRLAM System shall mean the complete code that is necessary for executing all configurations that are part of the agreed collaboration according to this Agreement. The ALADIN-HIRLAM System is composed of shared codes of four different types:

- *the ALADIN Common Codes, defined as the codes jointly developed, maintained and owned by the ALADIN Consortium;*

- *the HIRLAM Common Codes, defined as the codes jointly developed, maintained and owned by the HIRLAM Consortium;*

- *the ALADIN-HIRLAM Common Codes defined as the codes jointly developed and maintained by both consortia;*

- *Other ALADIN-HIRLAM codes that are either co-owned or owned by third parties and shared under relevant provisions of agreements concluded by either consortium or by Member(s) thereof with such third parties extending rights to both consortia.*

ALADIN-HIRLAM Code Agreement

7.1 ALADIN and HIRLAM will co-operate in a number of areas. The co-operation, initially organised around the shared ALADIN- HIRLAM System defined above, will evolve towards a full ALADIN-HIRLAM Common System based on common codes. At a precise stage during the term of this Agreement and after successful collaboration, all of the respective ALADIN and HIRLAM Common Codes will be regarded as ALADIN - HIRLAM Common Codes upon a joint decision by the ALADIN Assembly and HIRLAM Council, including appropriate arrangements for co-ownership. Both Consortia will seek arrangements with third parties to convert other shared codes into ALADIN -HIRLAM Common Codes.

Canonical Model **Configurations vs. …** Forecast **System**

- Are a configuration of the ALADIN System (and later the ALADIN-HIRLAM System?) that has passed the sanity check (Mitraillette)
- One can think currently of two of them: AROME (MF) and the ALARO baseline.

Our “code universe”
Do we have a “seamless” system?

	Reanalysis	Numerical Weather Prediction	Climate
Global	ERA-40 ERA-Int, ...	IFS ARPEGE	ARPEGE-clim, CNRM CMIP runs
Meso scale	Downscaling	ALADIN	ALADIN-climate ENSEMBLES, CORDEX, ...
Convection permitting		***HFS?, LFS?*** ALARO AROME	ALARO-climate AROME-climate

ToR Code Architect, a novelty in the ALADIN MoU

Option 1: 0.5 FTE, stream two

1. The ALADIN/HIRLAM Code Architect shall technically assist the ALADIN PM in supervising the definition of the ALADIN System, see, Art. 52.[1]

2. This includes the following tasks; the Code Architect (CA)
   - will finalize the physics-dynamics action;
   - will document the scientific consistency between different physics packages and the dynamics;
   - propose technical solutions to implement new pieces of code in the model code, consistent with the common numerical frame (including the physics-dynamics interface and the constraints from the time step organization);
   - will execute a 5-y engineering program to define a Limited-Area Forecast System ("brand" to be decided), according to the road map put forth in Fig 2;
   - will monitor the definition of the two *canonical model configurations* ALARO and AROME
3. The CA will de facto be part of CSSI and will work in close collaboration with ACNA.

Common verification/validation tools

	Compute scores on the fly	Monitoring of the applications in the countries	Validation of new cycles	Science verification	Verify fields or pointwise
ALADIN Performance Monitoring Tool in Ljubljana (APMT)	yes	yes	no	no	pointwise (station data)
HARP	yes	yes (through APMT)	no	yes	both
HIRLAM verification tool: The HARMONIE system	no	no	yes	yes	pointwise

“Branding”

HFS: HARMONIE Forecast System ?

LFS: *LAM Forecast System*

Suggestions needed for PAC/HAC

If you have an suggestion for other name(s), send it to
piet.termonia@meteo.be

(this not an official enquiry, just to steer the debate)

Let us hope the future will become

better than expected,

But for this it helps if you know what to expect

For this we need a good *Understanding*