



# *openETCS* itea2 Review

## WP7 – Toolchain Development

supported by:



Federal Ministry  
of Education  
and Research



Région de  
Bruxelles-  
Capitale



GOBIERNO  
DE ESPAÑA

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DE CIENCIA  
E INNOVACIÓN

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openETCS@ITEA2 Project

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Michael Jastram

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Paris, July 3rd 2013

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# The Big Picture



**WP7  
Toolchain**

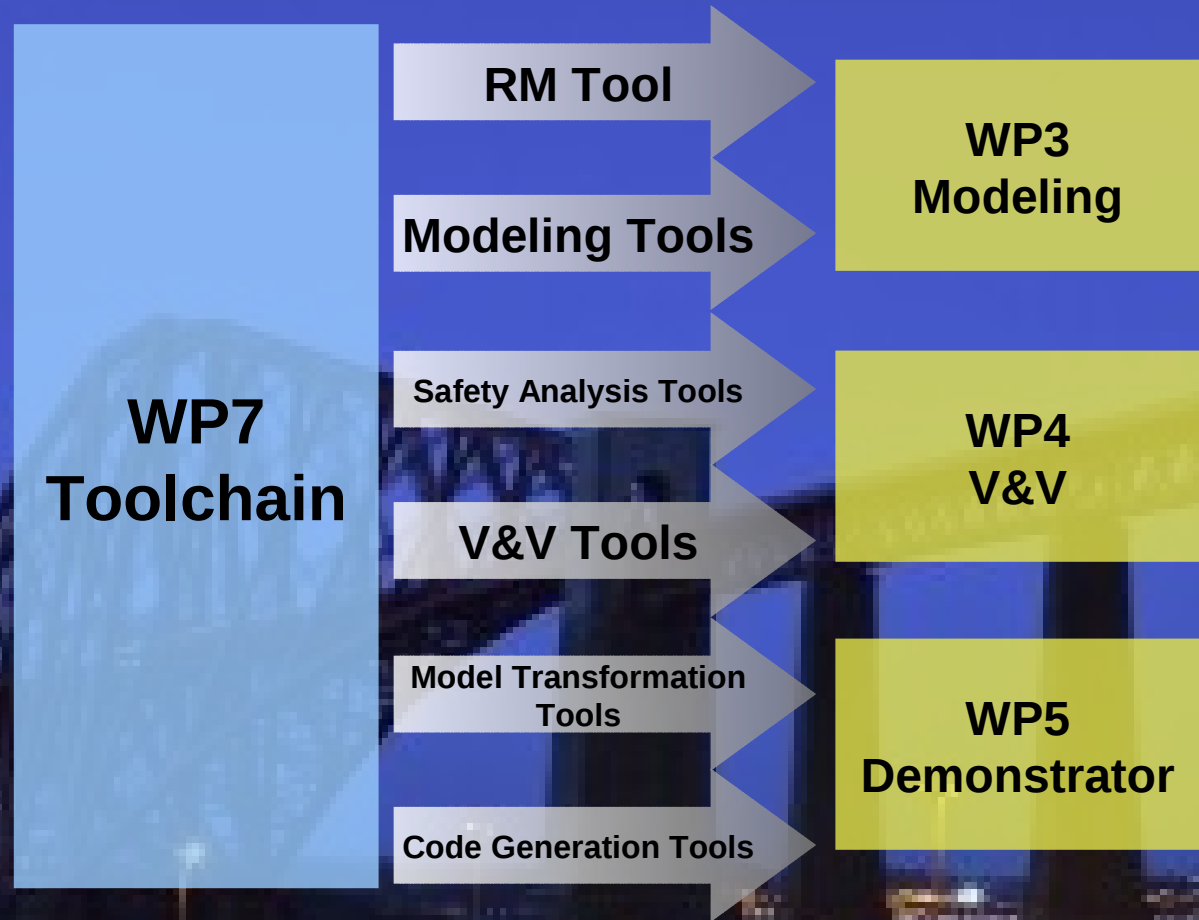
# The Big Picture

**WP7  
Toolchain**

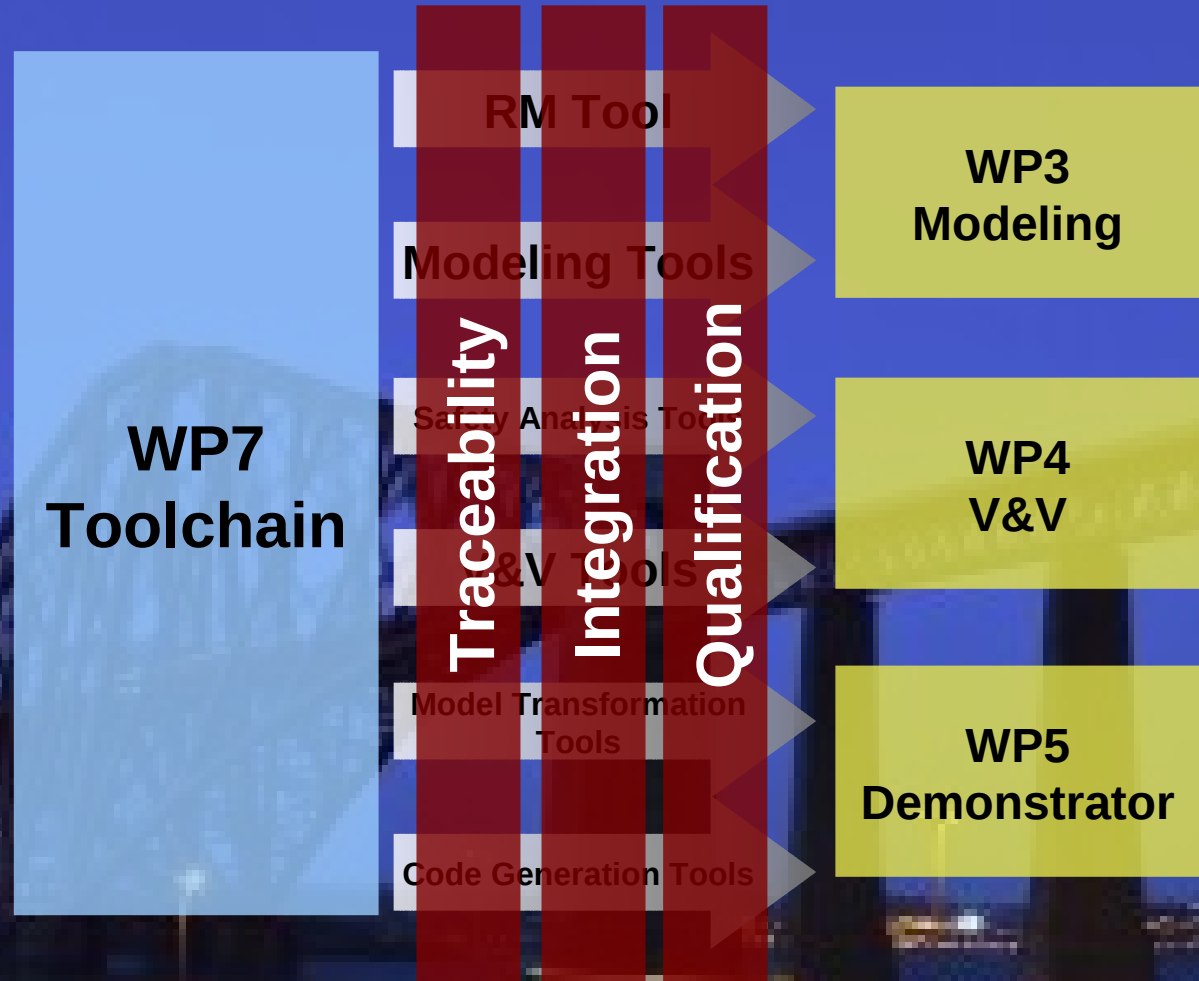
**Modeling Tools**

**WP3  
Modeling**

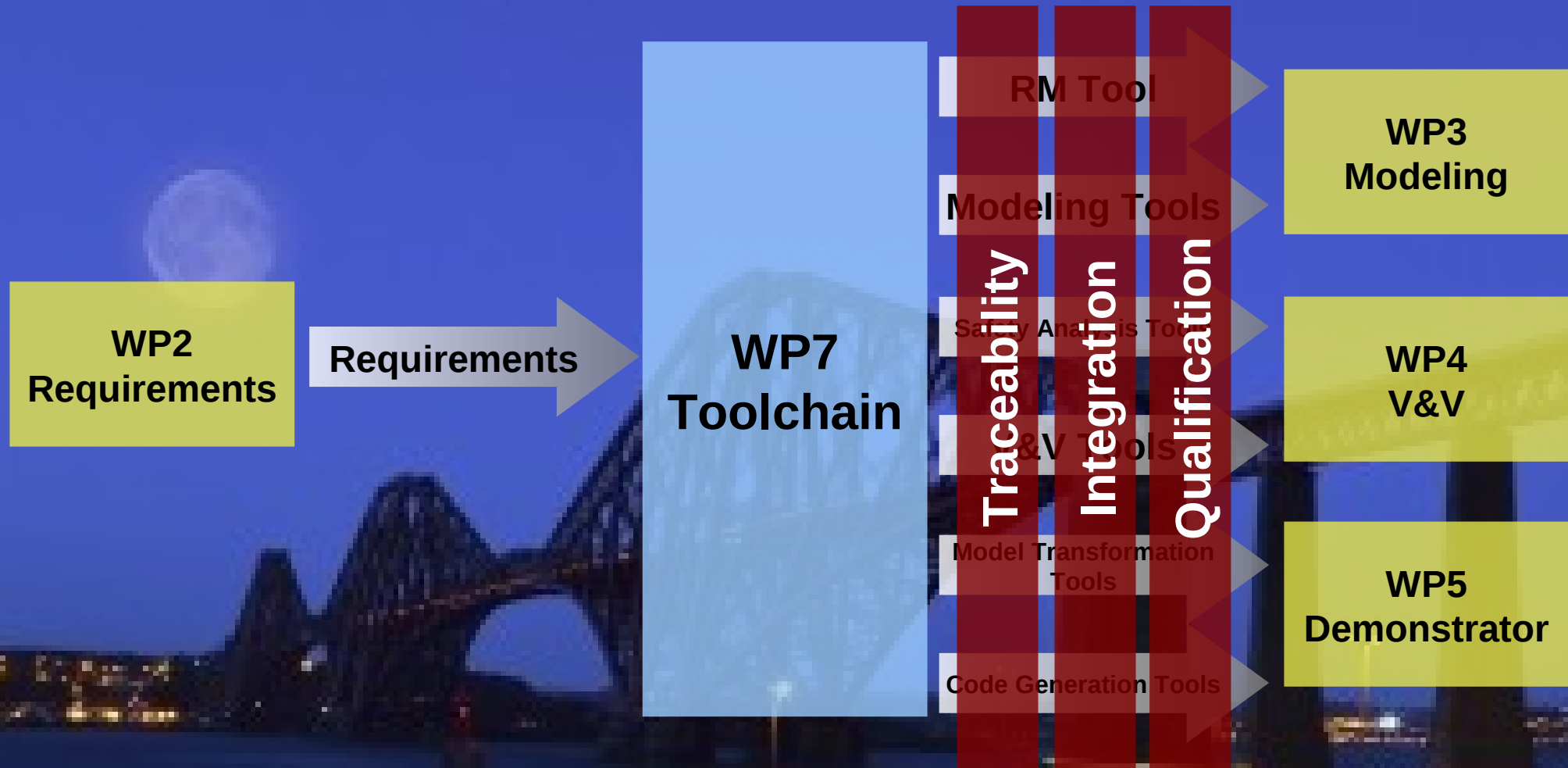
# The Big Picture



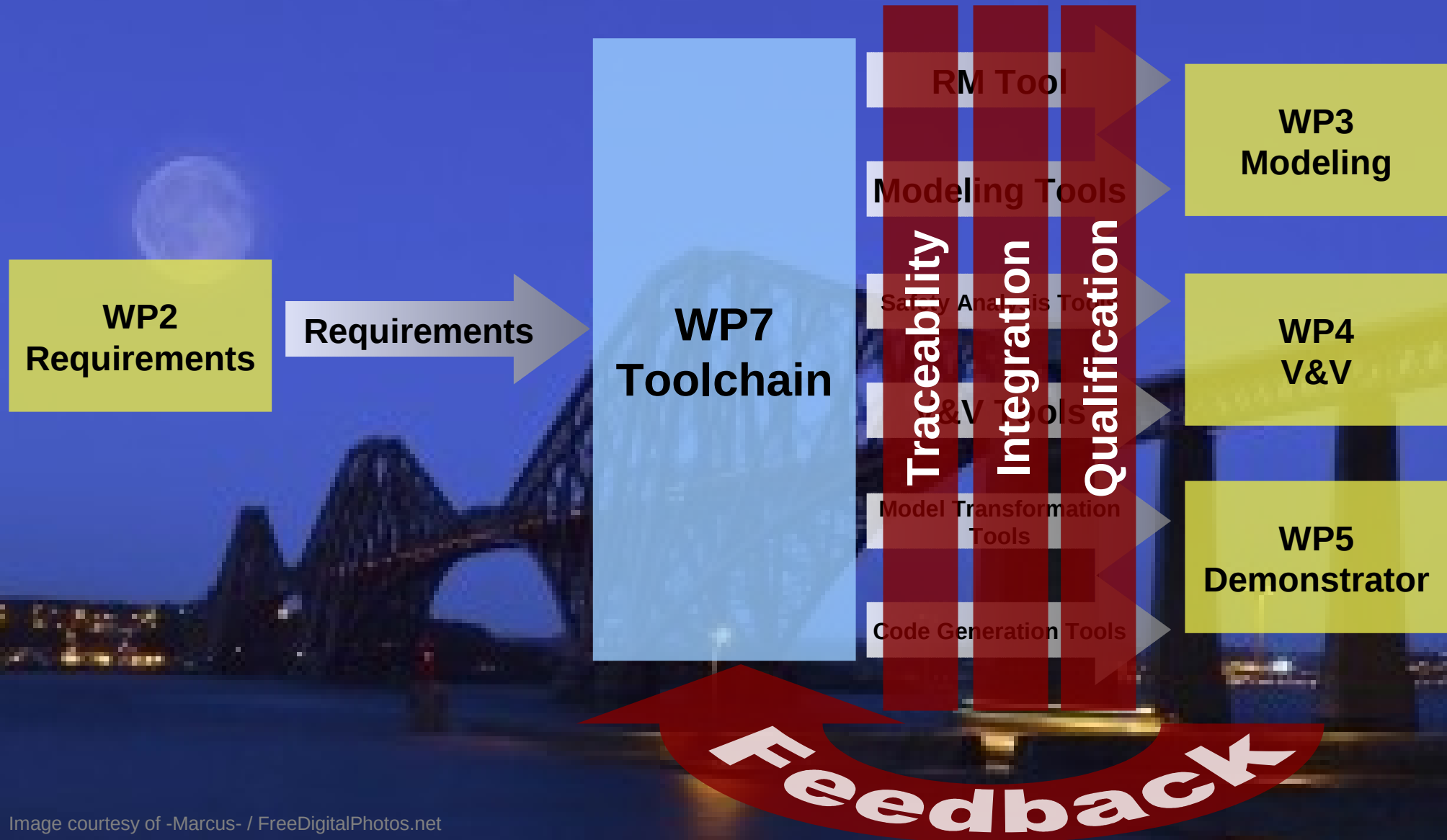
# The Big Picture



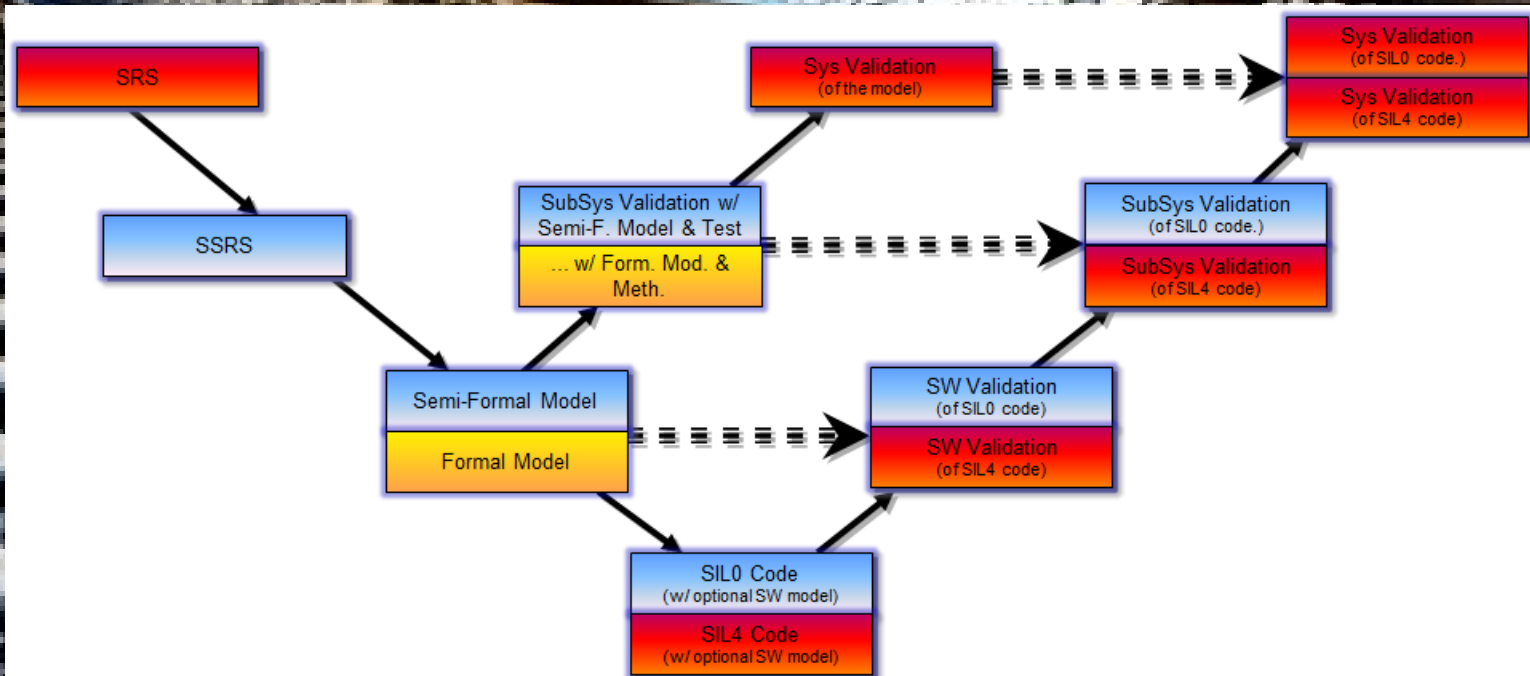
# The Big Picture



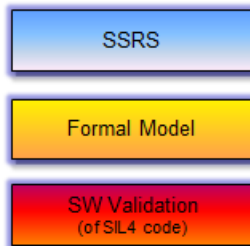
# The Big Picture



# An Integrated Tool Chain



Source: <https://github.com/openETCS/requirements/tree/master/D2.6-9>



Task is part of the project

Task is part of the project but will  
done on a sample

Task is not part of the project

Note: Verification tasks between items that are part of the project  
are also part of the projects. They are not represented here  
to avoid cluttering of the drawing.

→ Normal process

≡ ≡ ≡ → Is used by



# Workpackage Structure



## WP7 Toolchain

Michael Jastram / Formal Mind

## T7.1 Primary Toolchain

Marielle Petit-Doche / Systere

## T7.2 Secondary Toolchain

Marielle Petit-Doche / Systere

## T7.3 Toolchain Development

Jan Peleska & Cécile Braunstein  
University Bremen

## T7.4 Ecosystem

Jonas Helming / EclipseSource

# Timeline

Today

2012

2013

2014

Q3

Q4

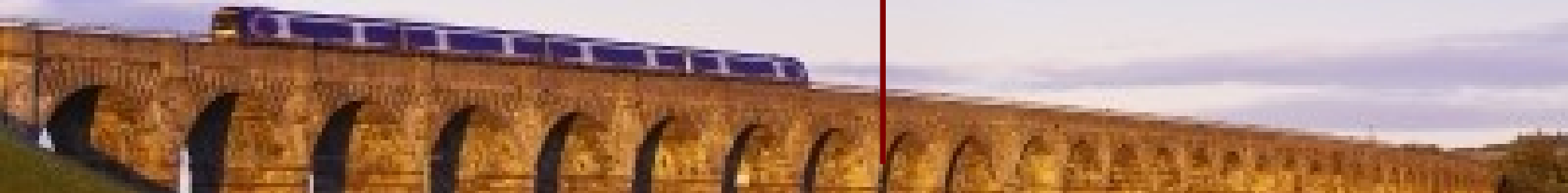
Q1

Q2

Q3

Q4

Q1



# Timeline

OpenETCS  
Kick-Off

WP7: Tooling

WP3: Modeling

Split of WP3

**Today**

**2012**

**2013**

**2014**

**Q3**

**Q4**

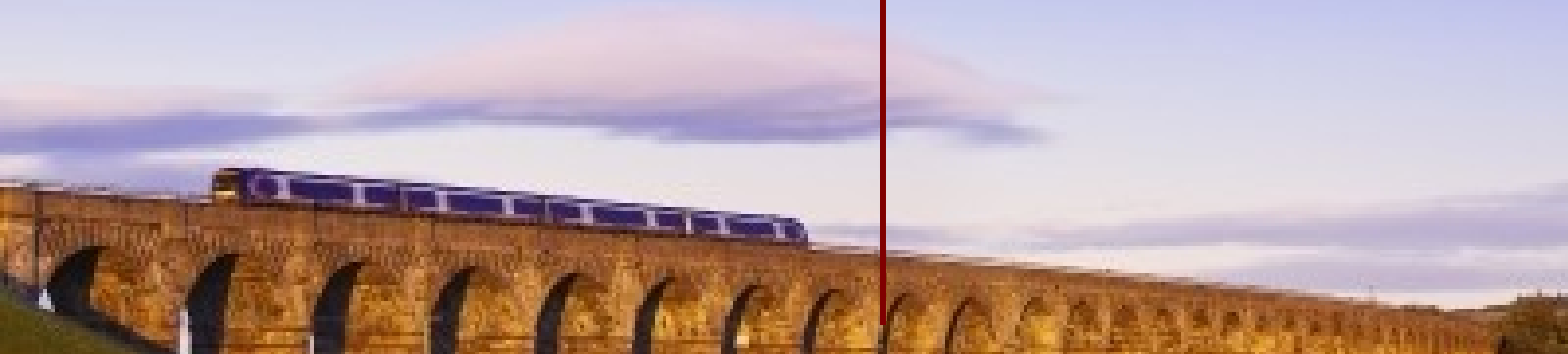
**Q1**

**Q2**

**Q3**

**Q4**

**Q1**



# Timeline

OpenETCS  
Kick-Off

WP7: Tooling

WP3: Modeling

Split of WP3

**Today**

**2012**

**2013**

**2014**

**Q3**

**Q4**

**Q1**

**Q2**

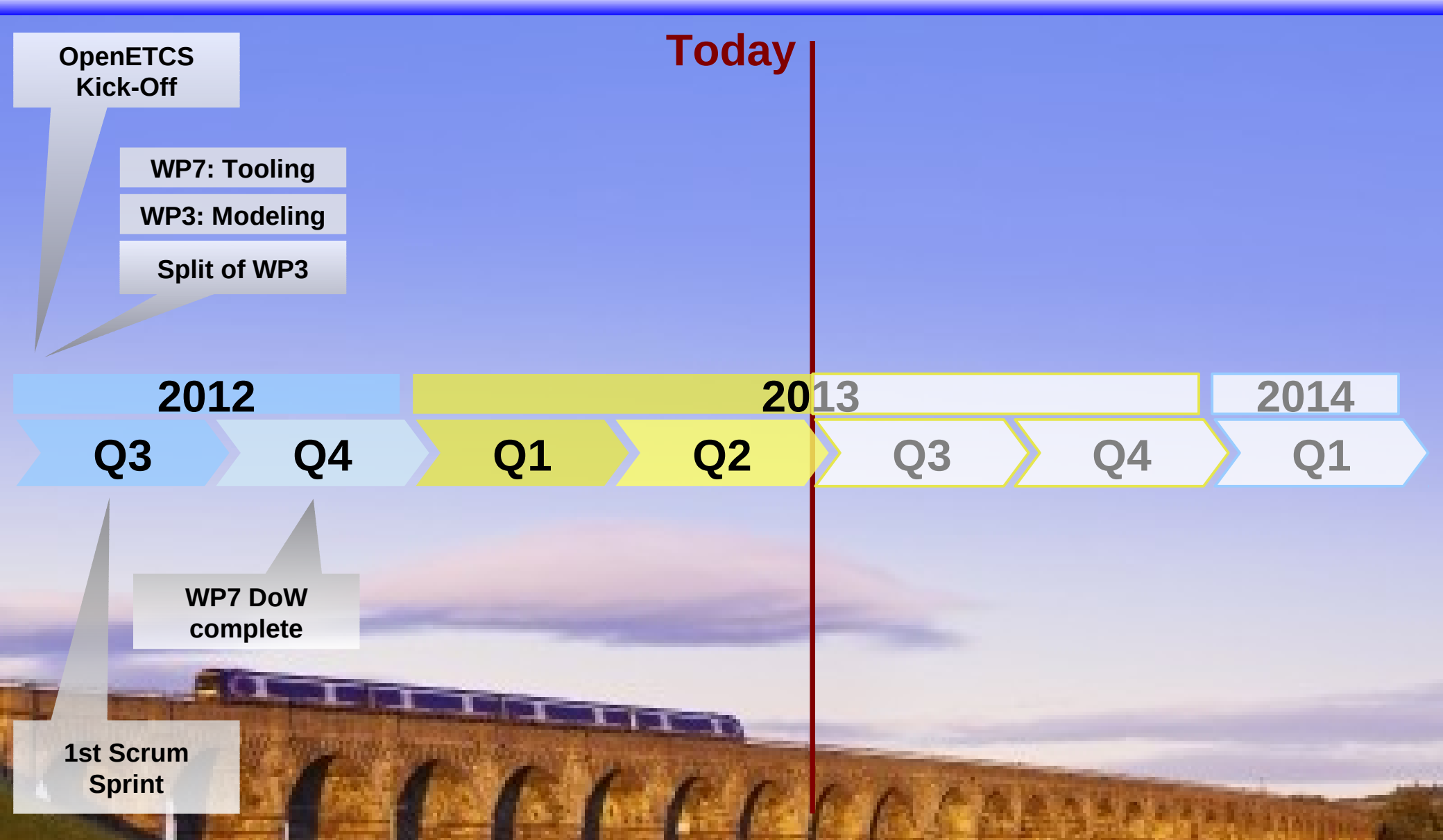
**Q3**

**Q4**

**Q1**

WP7 DoW  
complete

1st Scrum  
Sprint



# Timeline

OpenETCS  
Kick-Off

WP7: Tooling

WP3: Modeling

Split of WP3

First benchmark  
started

12 benchmarks  
underway

**Today**

**2012**

**2013**

**2014**

**Q3**

**Q4**

**Q1**

**Q2**

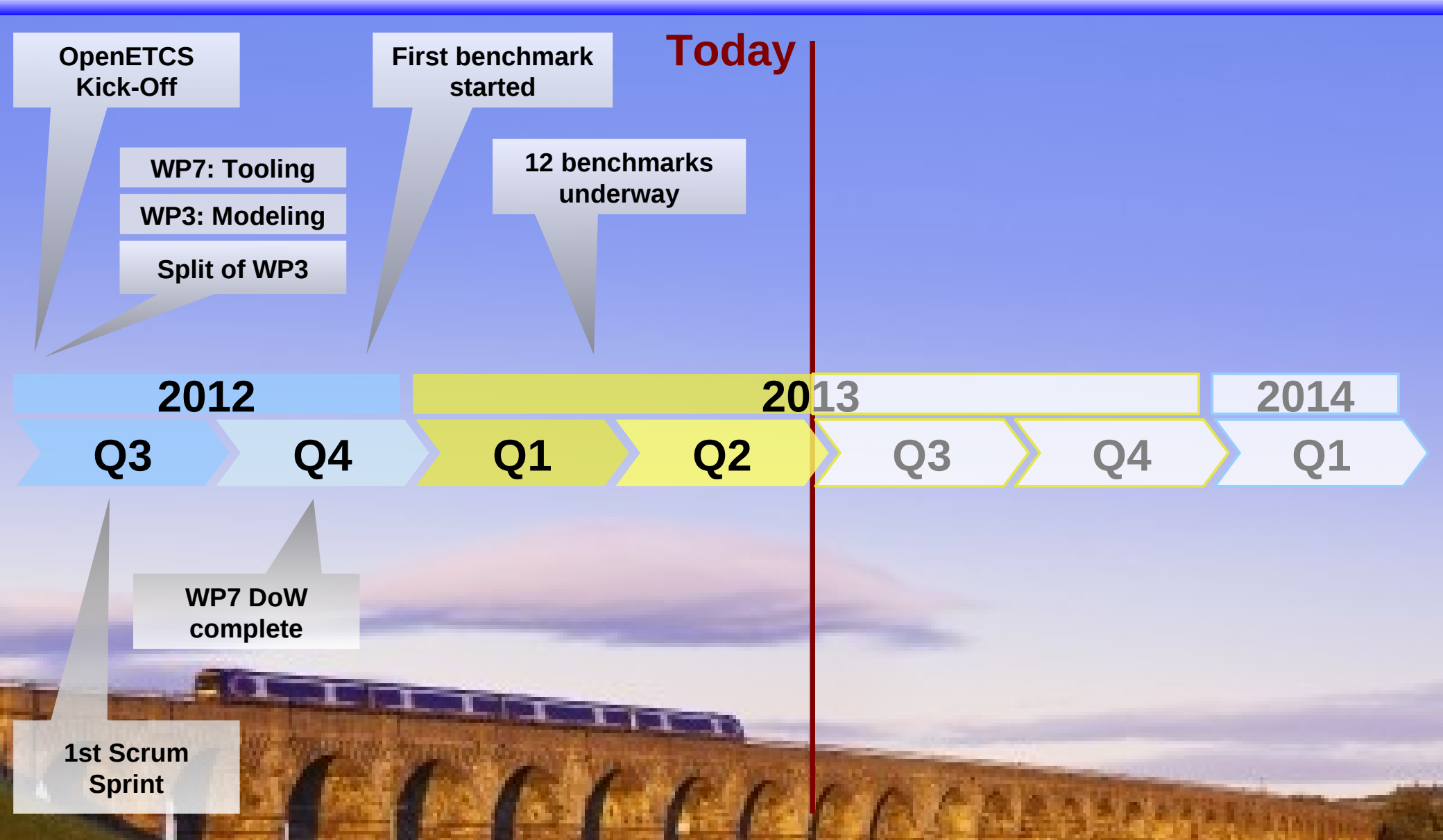
**Q3**

**Q4**

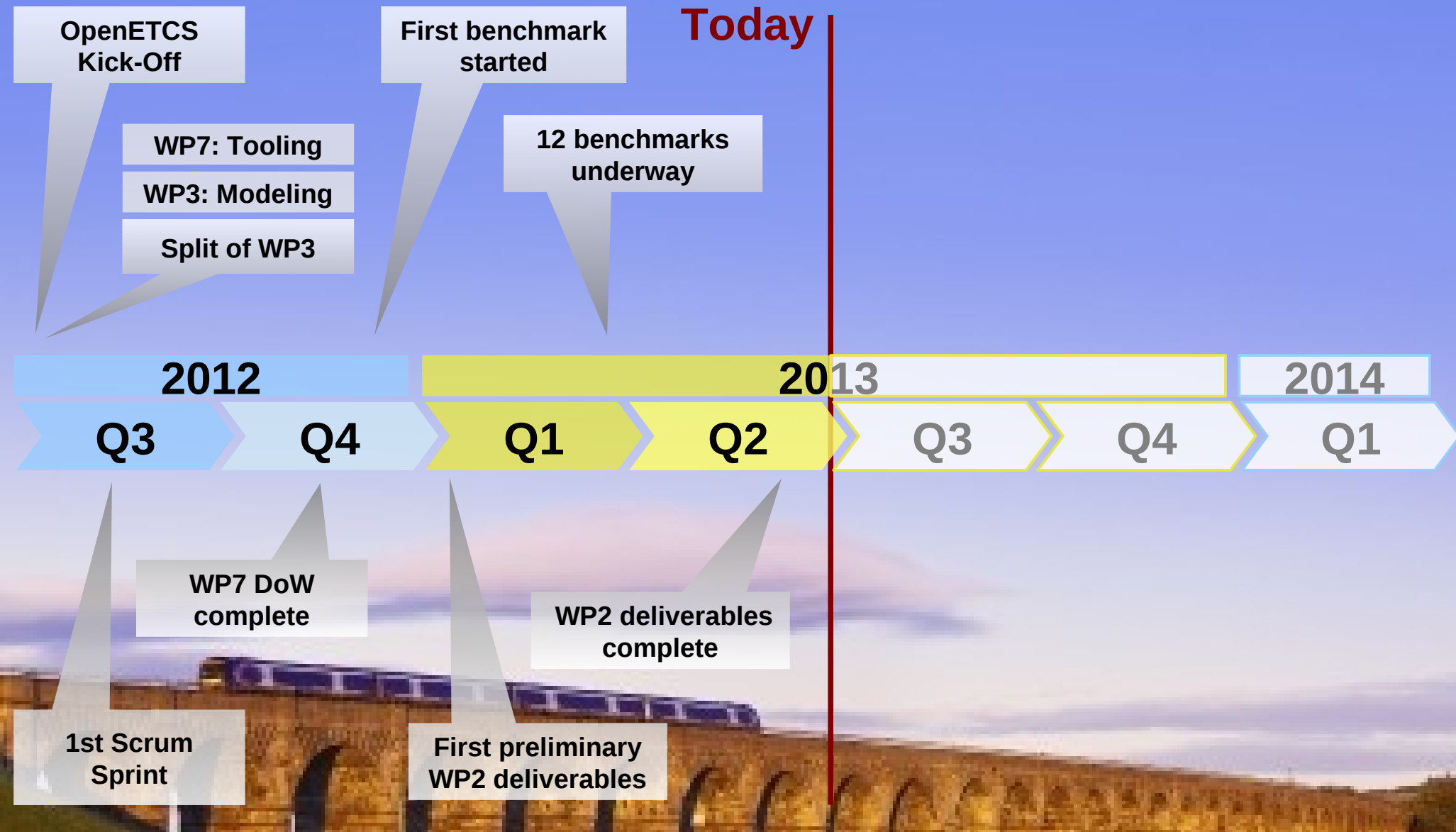
**Q1**

WP7 DoW  
complete

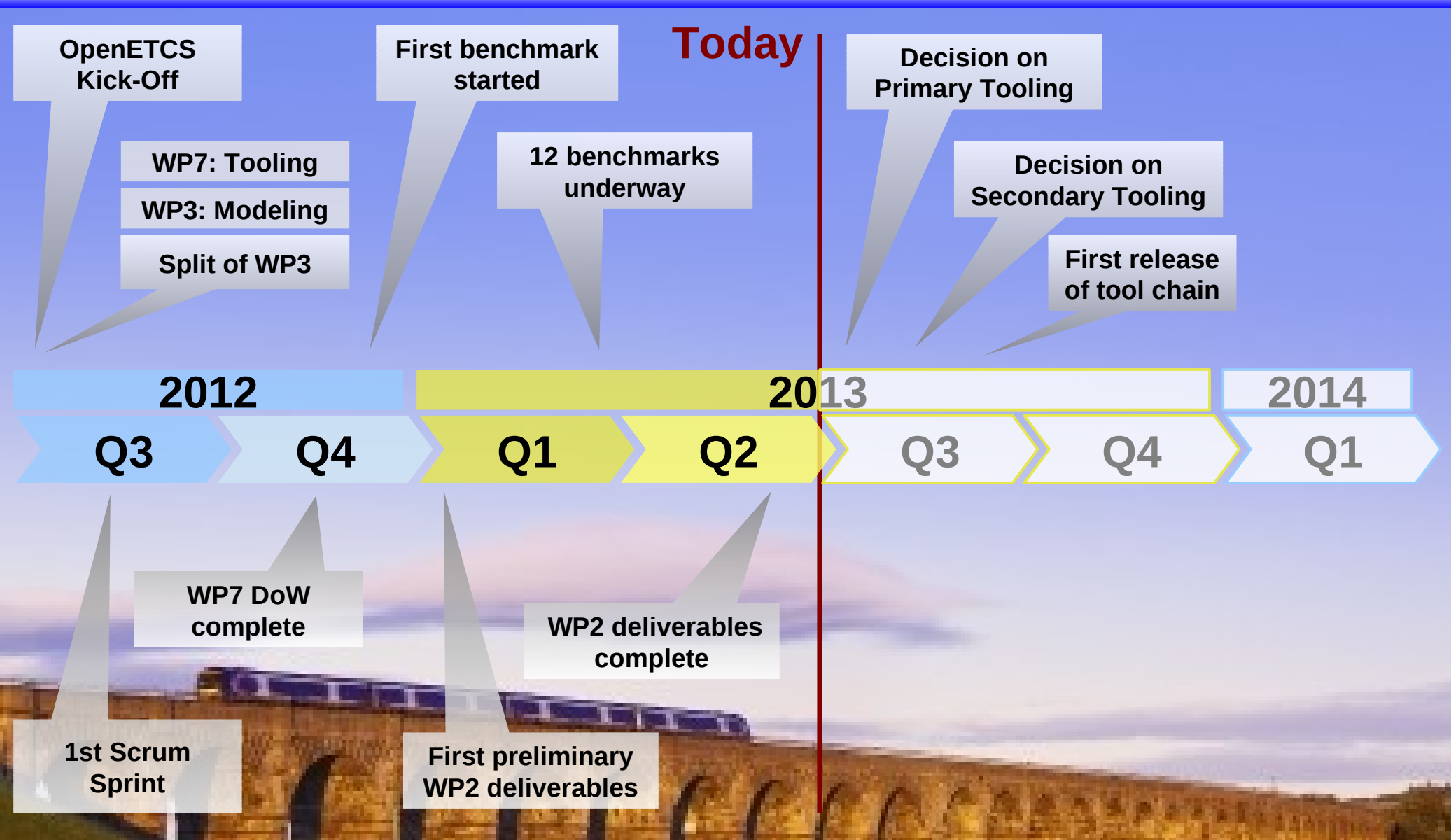
1st Scrum  
Sprint



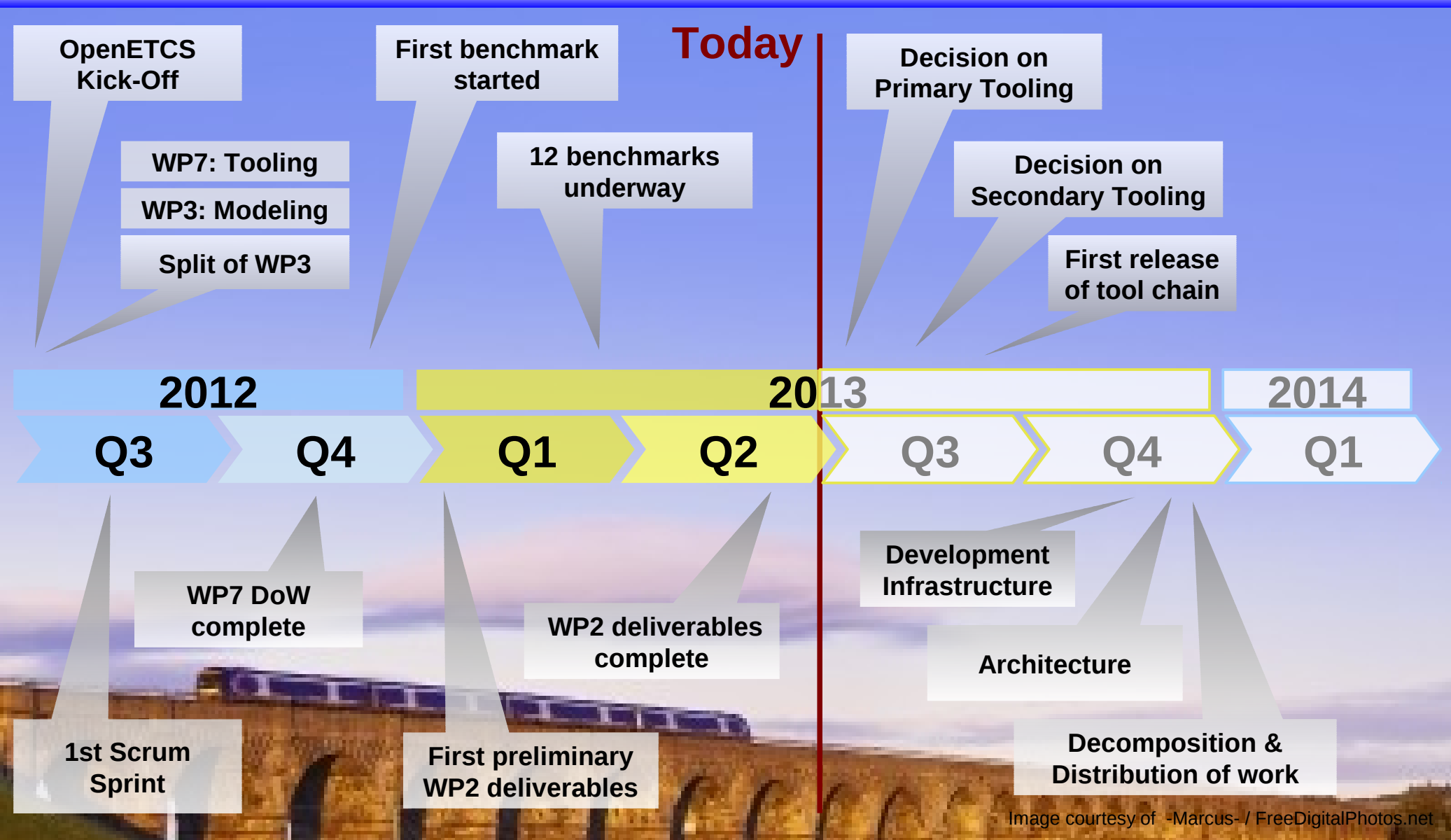
# Timeline



# Timeline

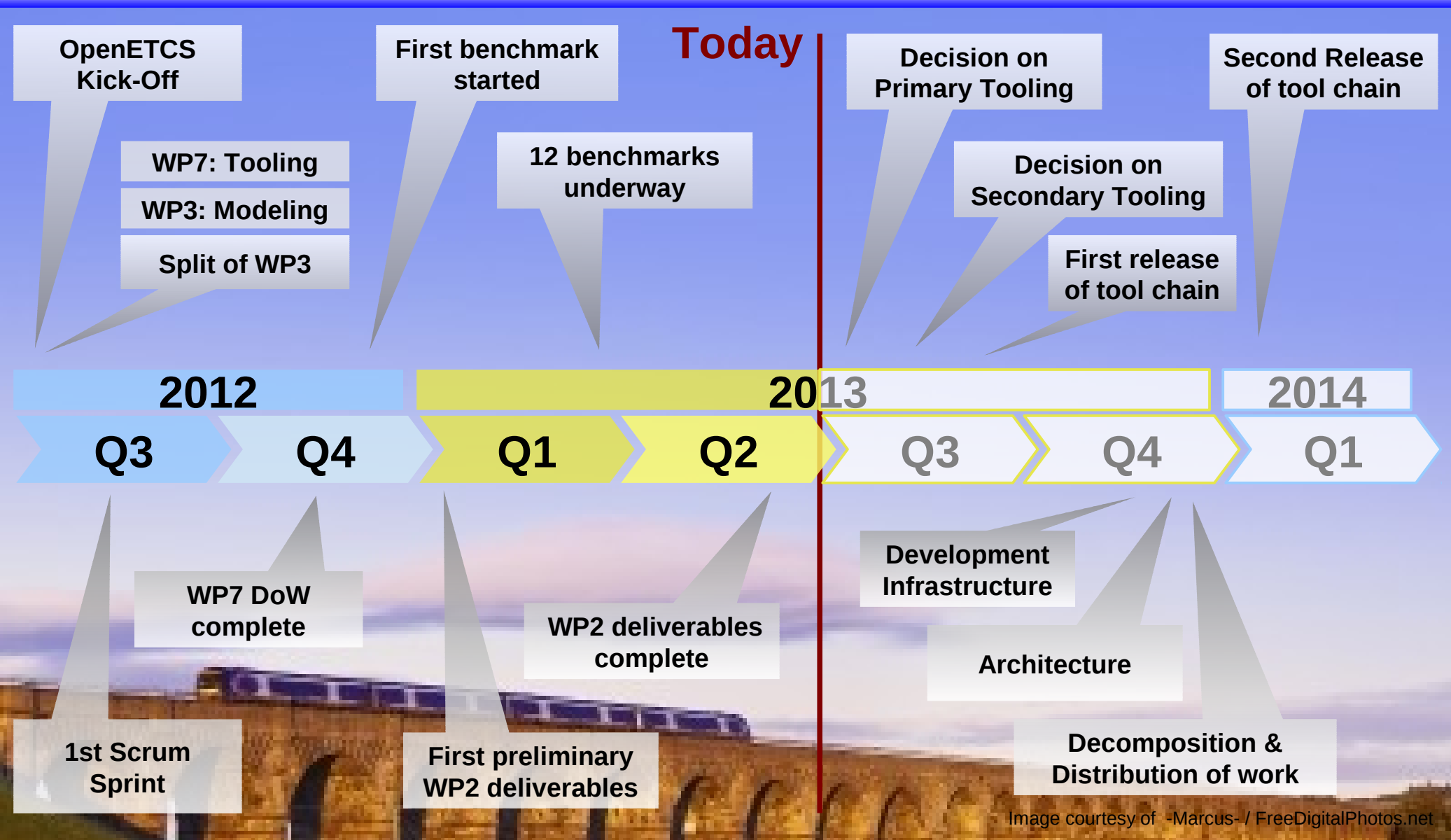


# Timeline

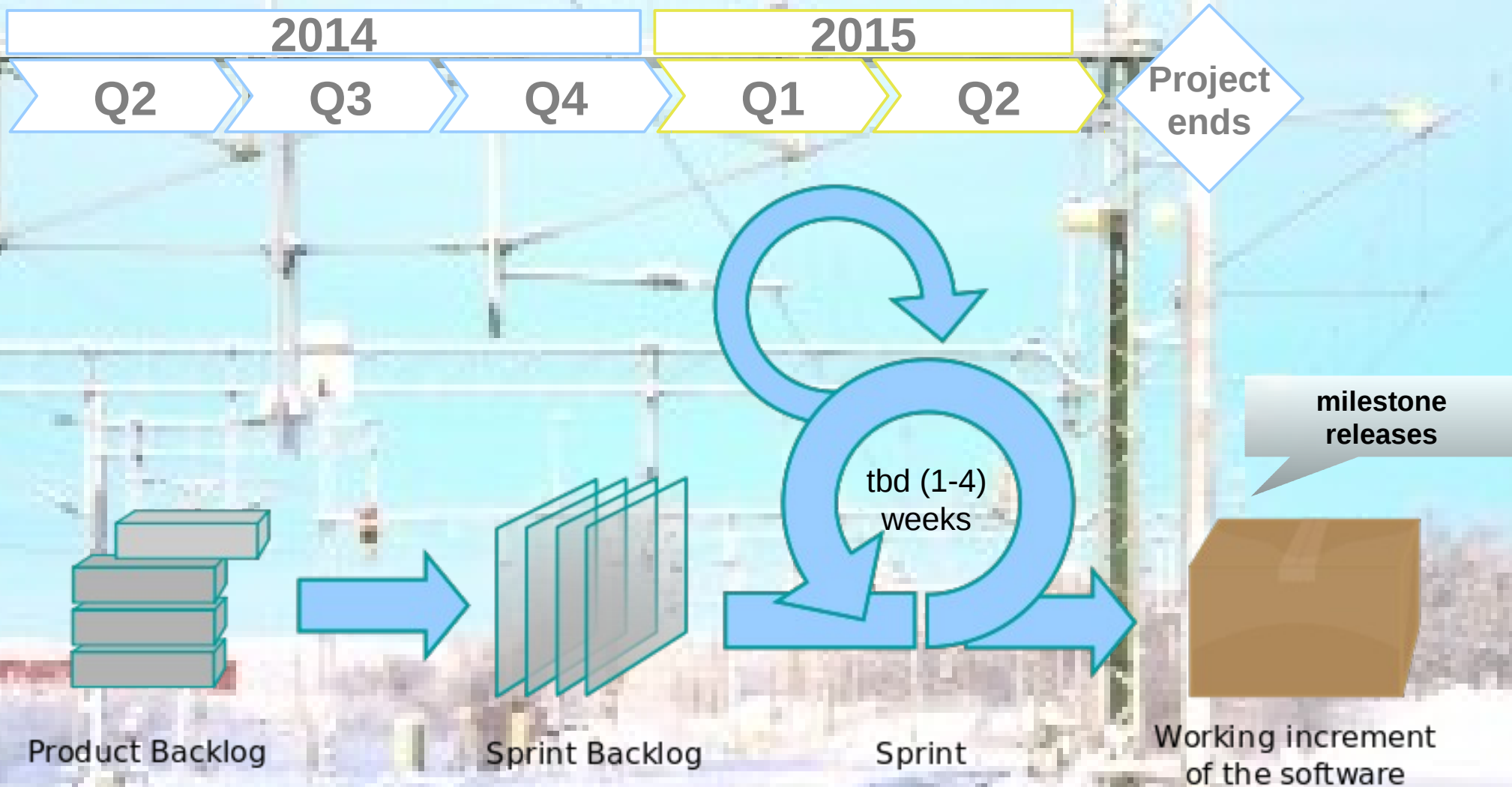




# Timeline



# 2014 – 2015: Regular releases



# No deliverables yet, but...

WP7 Objectives		
Date	Type of stone <sup>5</sup> /deliverable	Description
T0+13	D7.1 (Systerel)	Report on the final choice(s) for the primary tool chain (means of description, tool and platform)
T0+15	D7.2 (Systerel)	Report on all aspects of secondary tooling (results of T7.2)
T0+16	D7.4 (Uni-Bremen)	Tool chain first release
T0+19	D7.3 (Uni Bremen)	Tool chain qualification process description
T0+26		Regular releases according to Scrum Process
T0+36	D7.5 (Eclipse Source)	Ecosystem Artefacts: Proposed Terms of use, Proposed Committer Agreements, Proposed IP Policy, Proposed Development Process Description, Development Process Guidelines, Infrastructure Documentation, Infrastructure Template, Evolution Report of previous Deliverables

Source: [https://github.com/openETCS/management/blob/master/FPP/11025\\_openETCS\\_FPP\\_Annex\\_v301.pdf](https://github.com/openETCS/management/blob/master/FPP/11025_openETCS_FPP_Annex_v301.pdf)



## ... but concrete results (primary tools)

Formalism / Tool	Status
SCADE 6.3.1	Done
ERTMSFormalSpecs	Done
CORE Workstation 5.1	<b>Stopped</b>
Event-B / Rodin 2.7 with ProR, ProB or AnimB and toolkit of provers (AtelierB, SMT,...)	Done
ClassicalB / AtelierB 4.0.2	Done
Why3 0.80	<b>Stopped</b>
GNATprove	Done
SysML/EA, RT-Tester	Done
GOPRR (GOPRR) meta meta model / MetaEdit+	Done
SysML / Papyrus	Done
SystemC	Done
UPPAAL	<b>Moved</b>
Petri Nets / Design/CPN	Done

# ... but concrete results (secondary tools)

Formalism / Tool	Model transform ation	Require ment manage ment	Valid ation	Verifi cation	Safet y Analy ses
AtelierB			X	X	
SCADE Suite	X	X	X	X	
UPPAAL			X	X	
Rodin + pluggins (ProR, ProB, SMT solvers, IUML,...)	X	X	X	X	X
CPN-Tools & SPENAT			X	X	X
Goal Structuring Notation (GSN)		X			X
MaTeLo (Model Based Testing tool based on Markov Chains)		X	X		
Safety Architect (System Safety Analysis tool)					X
RT-tester			X	X	
Eclipse ProR		X			
Fiacre and Tina, model-checking toolbox for Time Petri Nets				X	
SPARK Ada					

# Thanks to the team

## **WP 7 Leadership**

Michael Jastram / Formal Mind

## **Task Leader 7.1 and 7.2**

Marielle Petit-Doche / Systerel

## **Task Leader 7.3**

Jan Peleska & Cécile Braunstein  
University of Bremen

## **Task Leader 7.4**

Jonas Helming / Eclipse Source

## **Thanks**

to the openETCS WP7 Team

