



# *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**

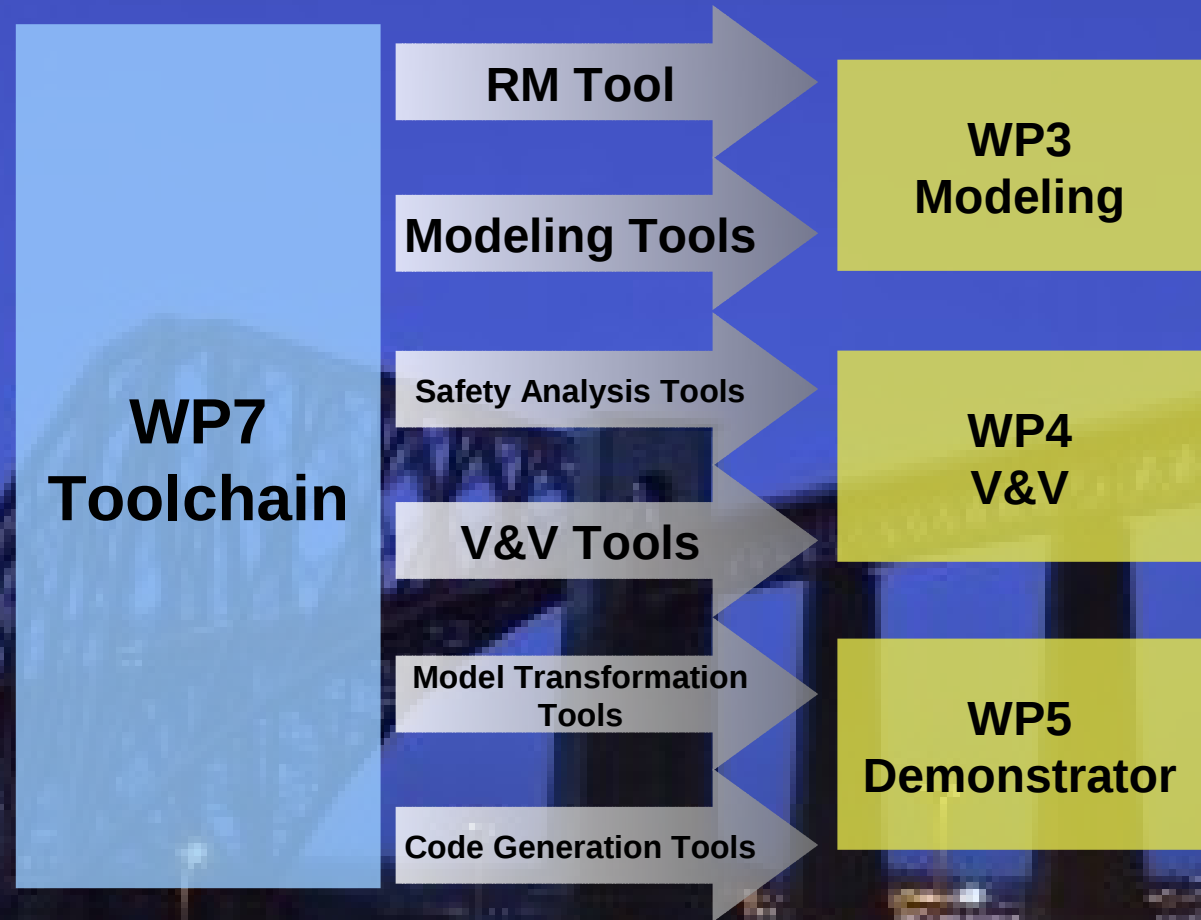
# The Big Picture

**WP7  
Toolchain**

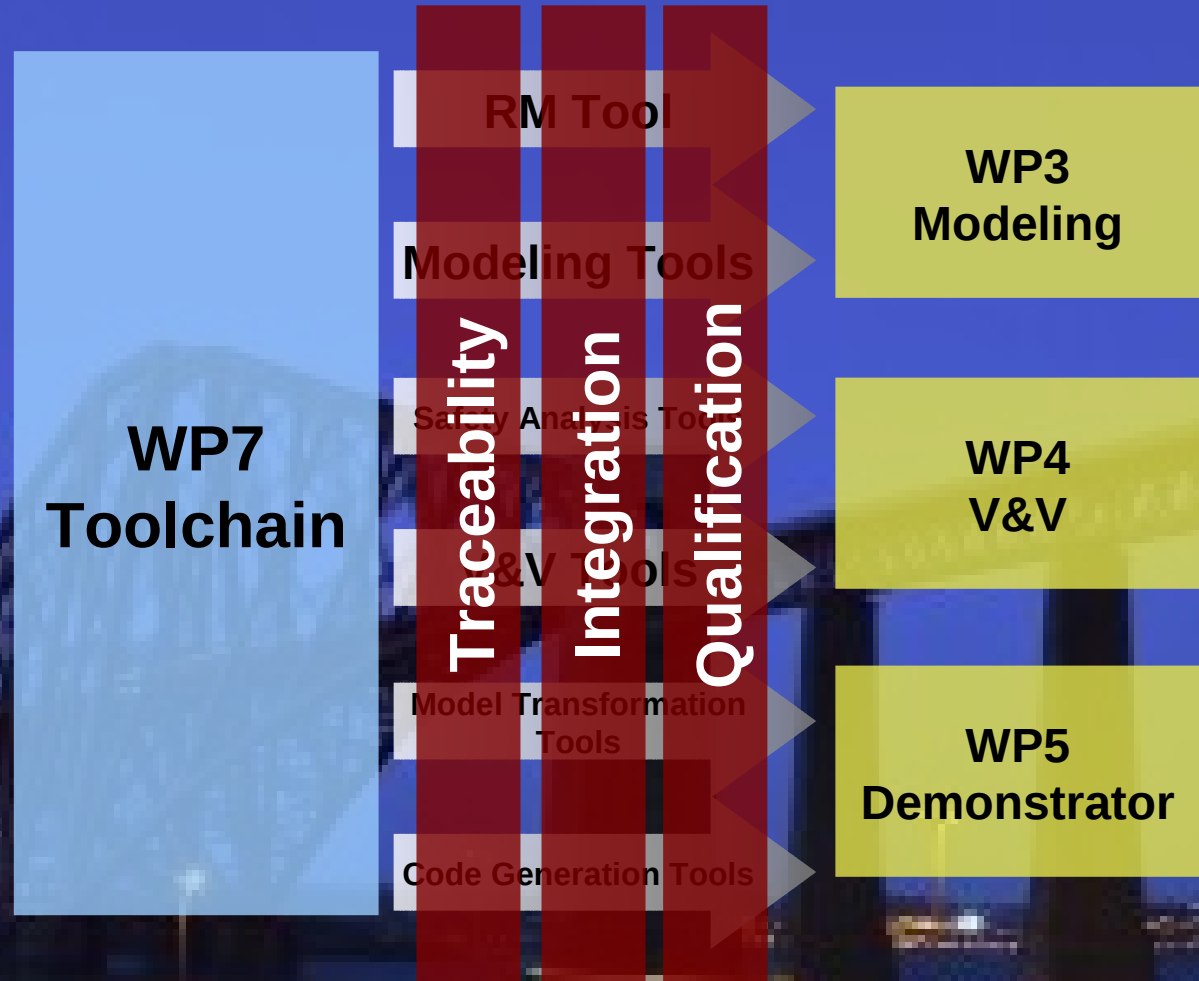
**Modeling Tools**

**WP3  
Modeling**

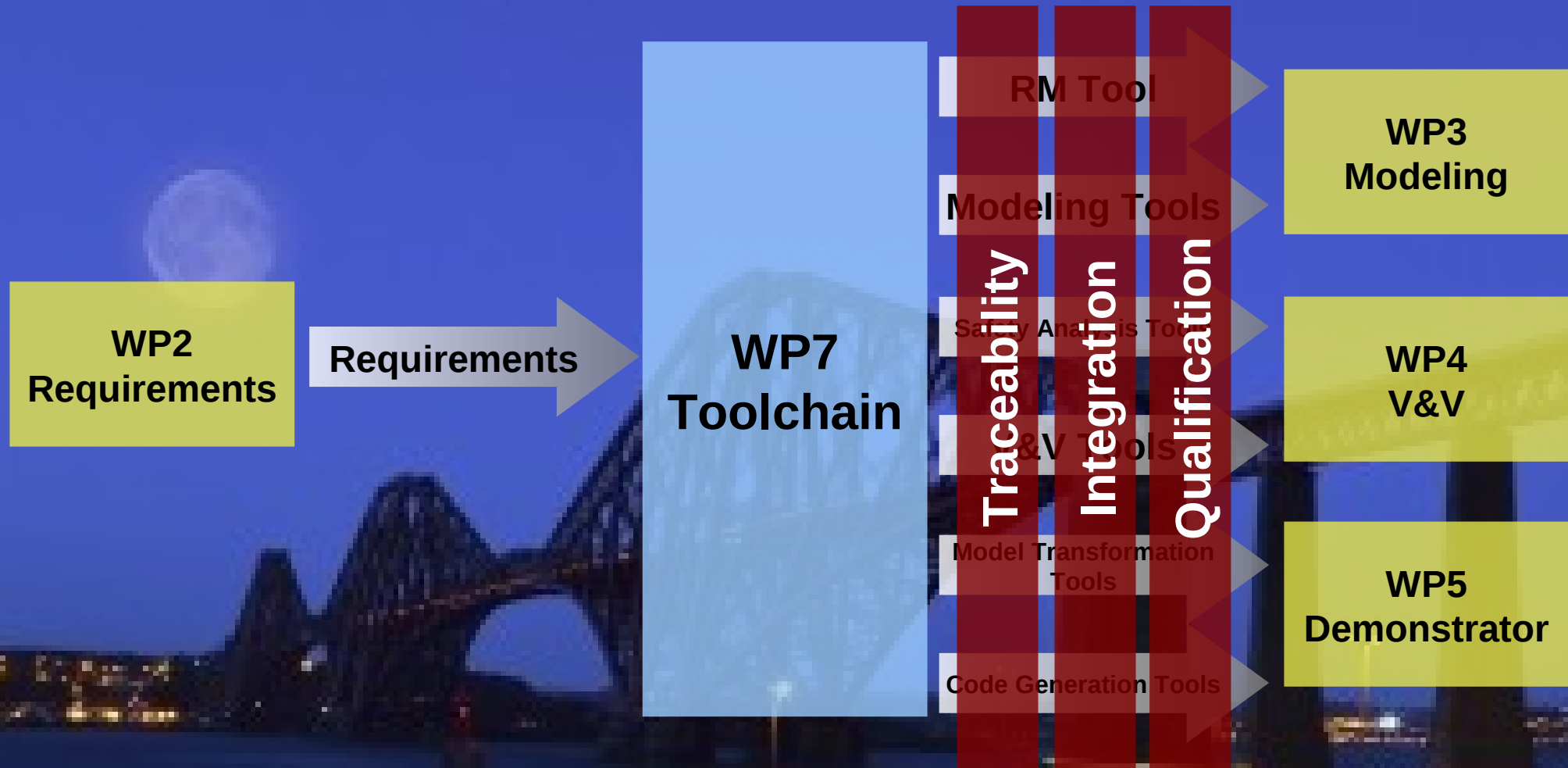
# The Big Picture



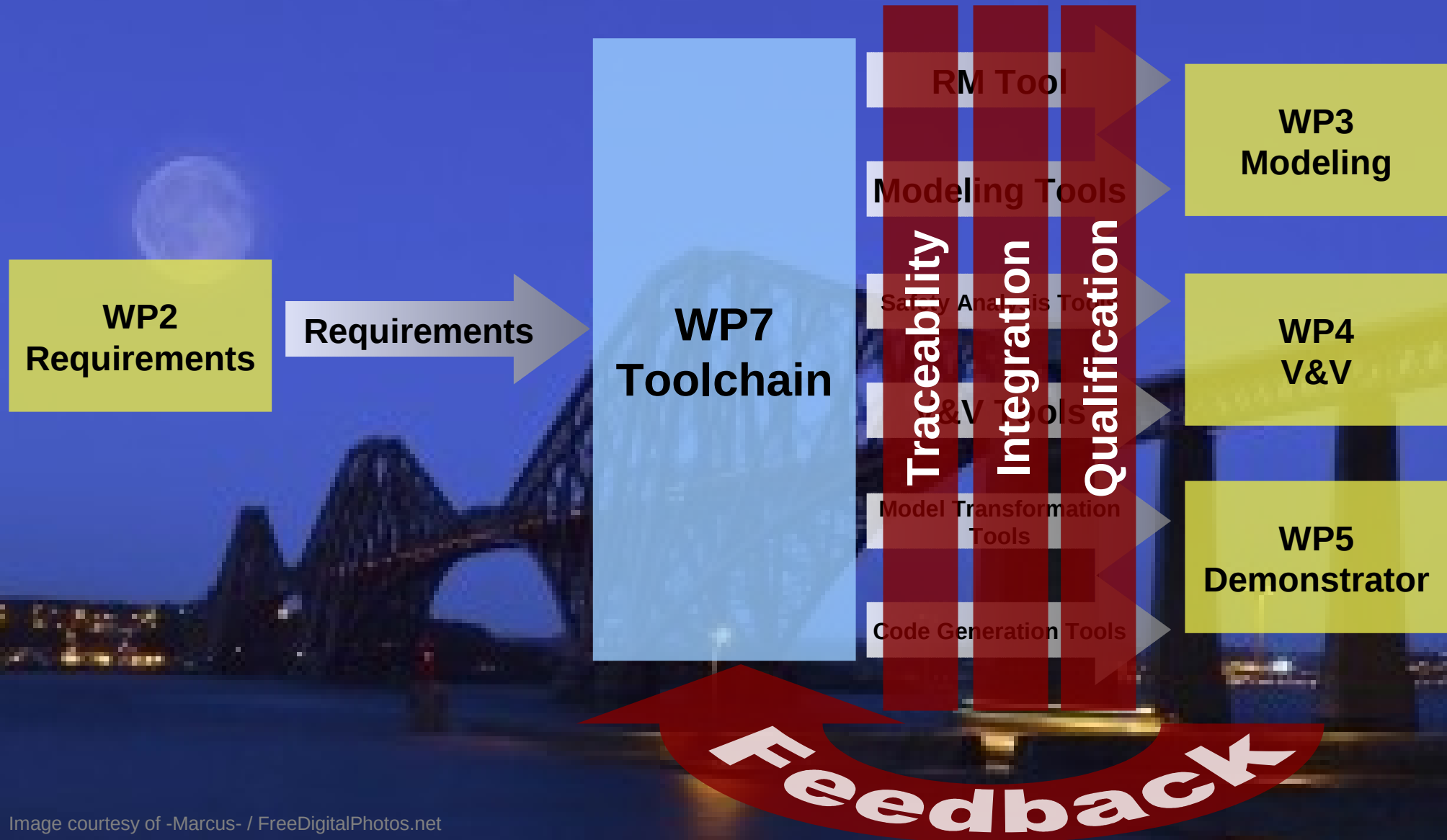
# The Big Picture



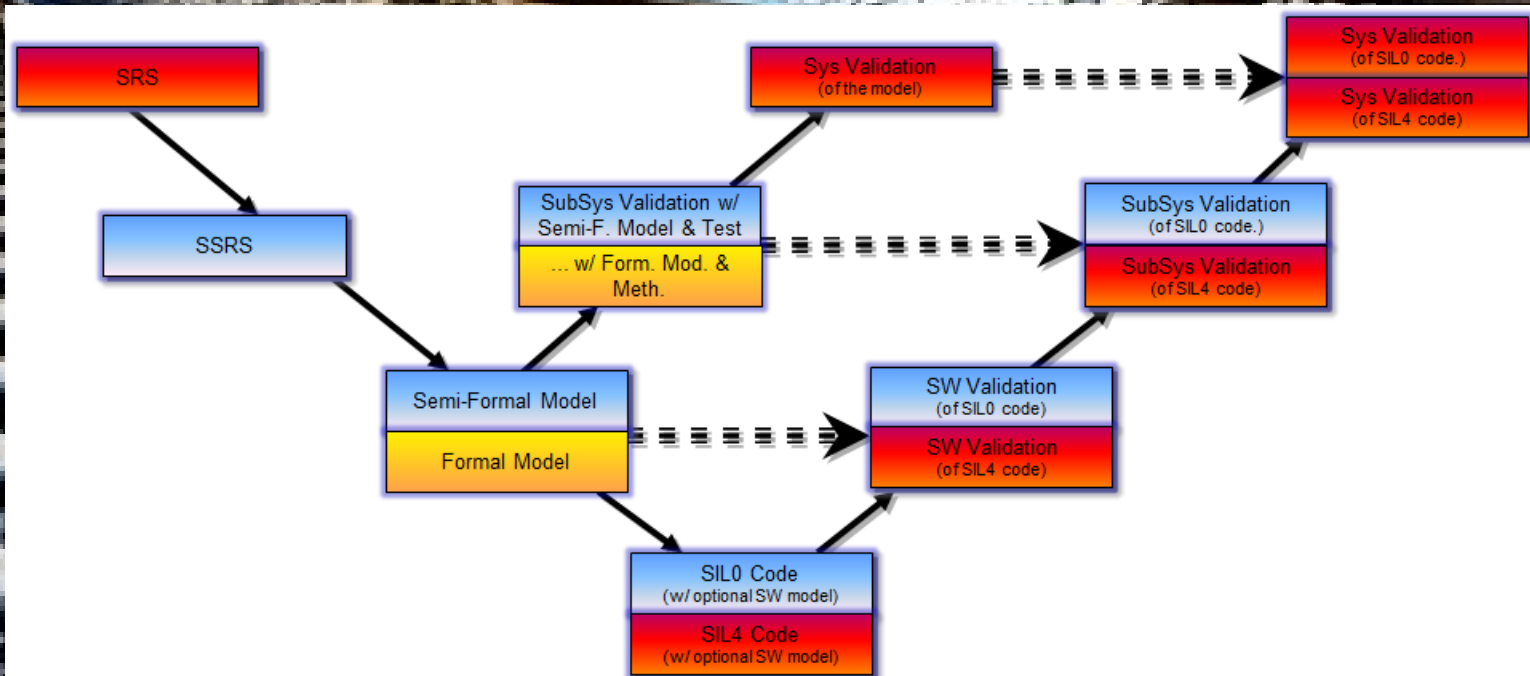
# The Big Picture



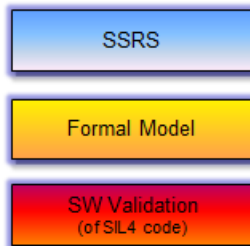
# The Big Picture



# An Integrated Tool Chain



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



Task is part of the project

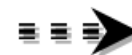
Task is part of the project but will  
done on a sample

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 / Systerel

## T7.2 Secondary Toolchain

Marielle Petit-Doche / Systerel

## T7.3 Toolchain Development

Jan Peleska & Cécile Braunstein  
University Bremen

## T7.4 Ecosystem

Jonas Helming / EclipseSource

# Timeline

Today

2012

2013

2014

Q3

Q4

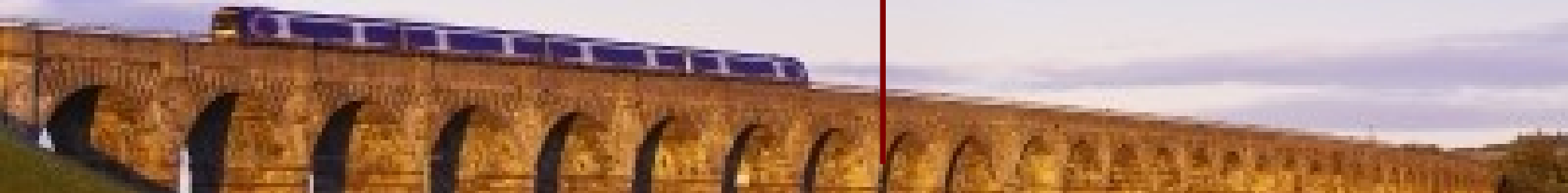
Q1

Q2

Q3

Q4

Q1



# Timeline

OpenETCS  
Kick-Off

WP7: Tooling

WP3: Modeling

Split of WP3

**Today**

**2012**

**2013**

**2014**

**Q3**

**Q4**

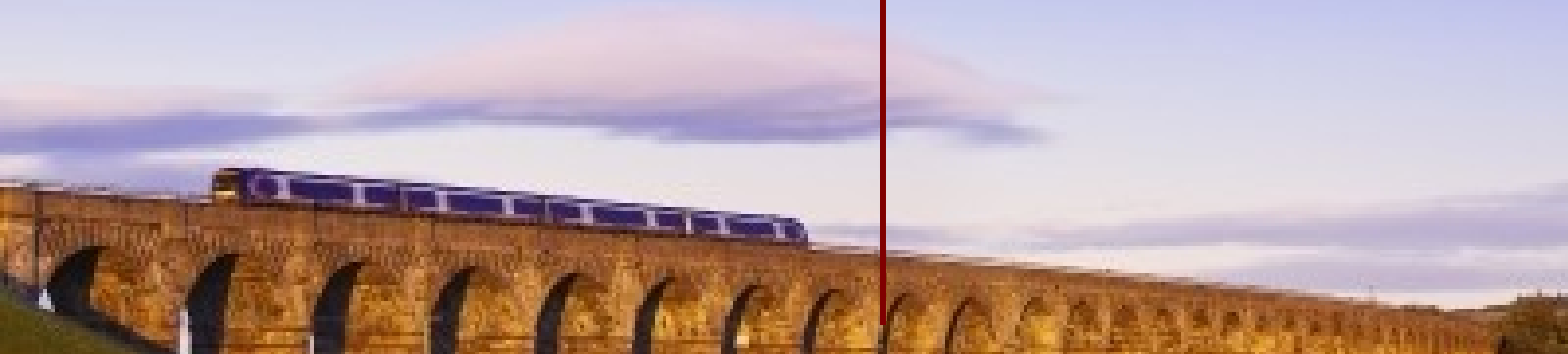
**Q1**

**Q2**

**Q3**

**Q4**

**Q1**



# Timeline

OpenETCS  
Kick-Off

WP7: Tooling

WP3: Modeling

Split of WP3

**Today**

**2012**

**2013**

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**Q4**

**Q1**

**Q2**

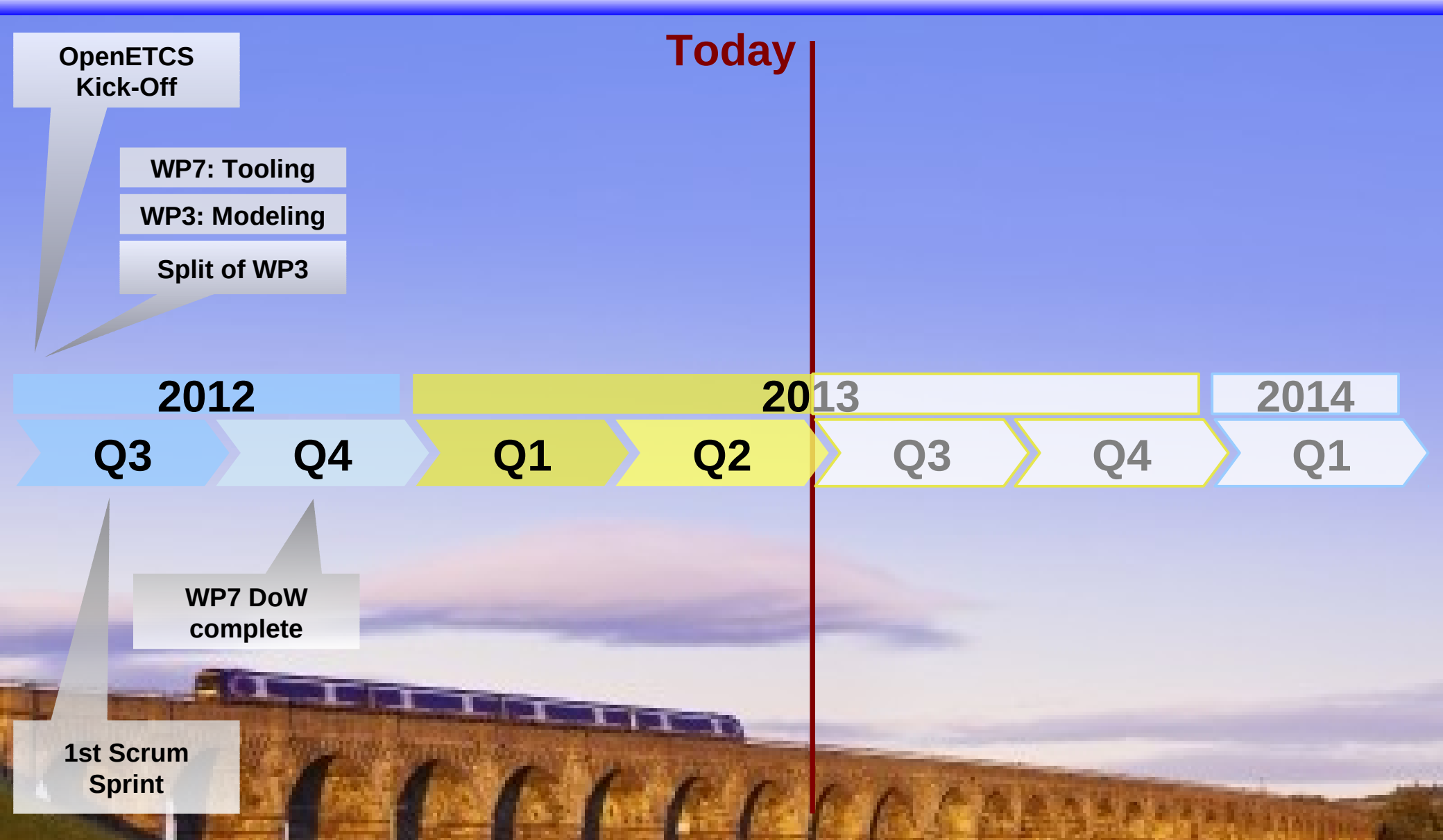
**Q3**

**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**

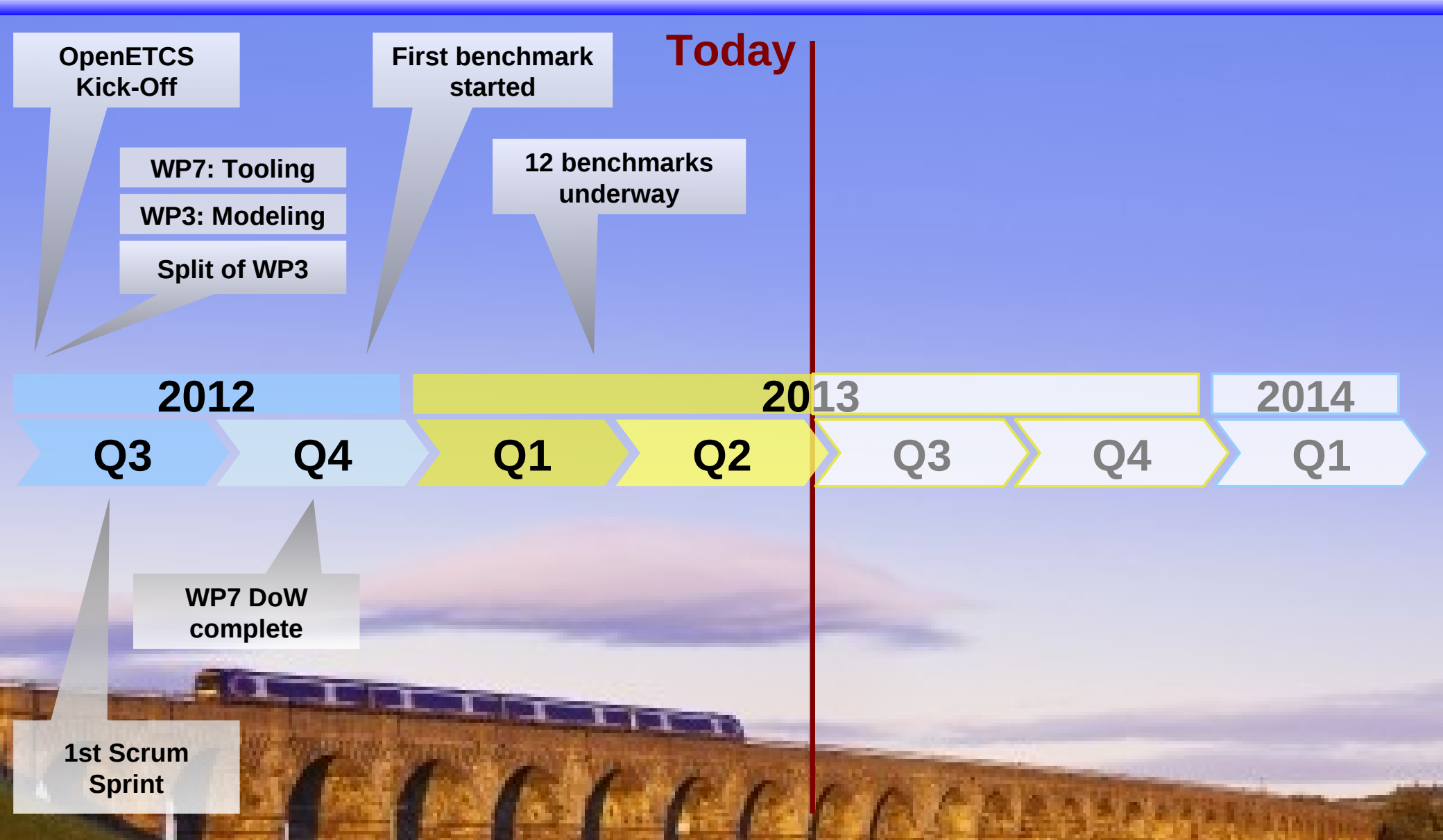
**Q3**

**Q4**

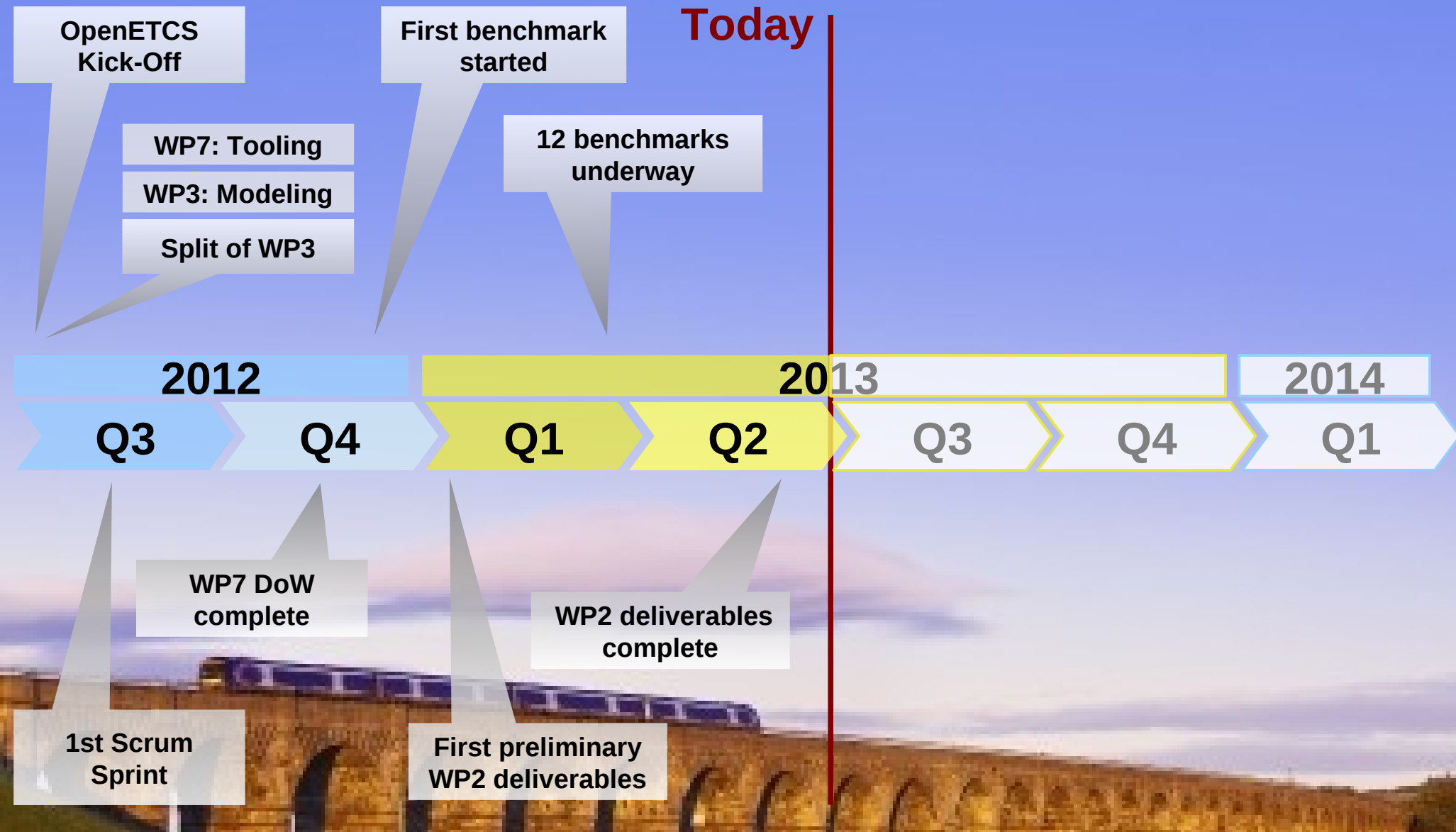
**Q1**

WP7 DoW  
complete

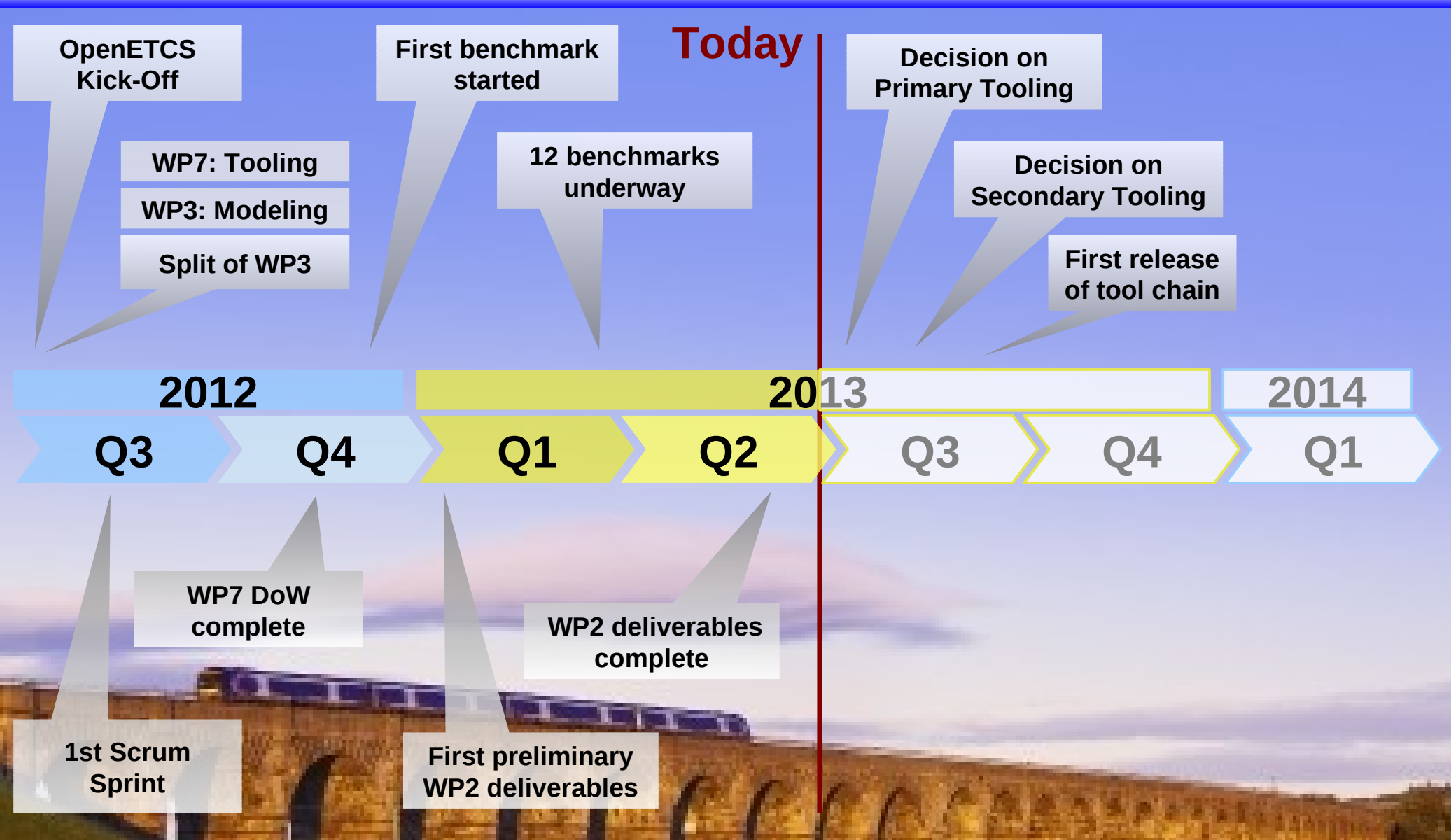
1st Scrum  
Sprint



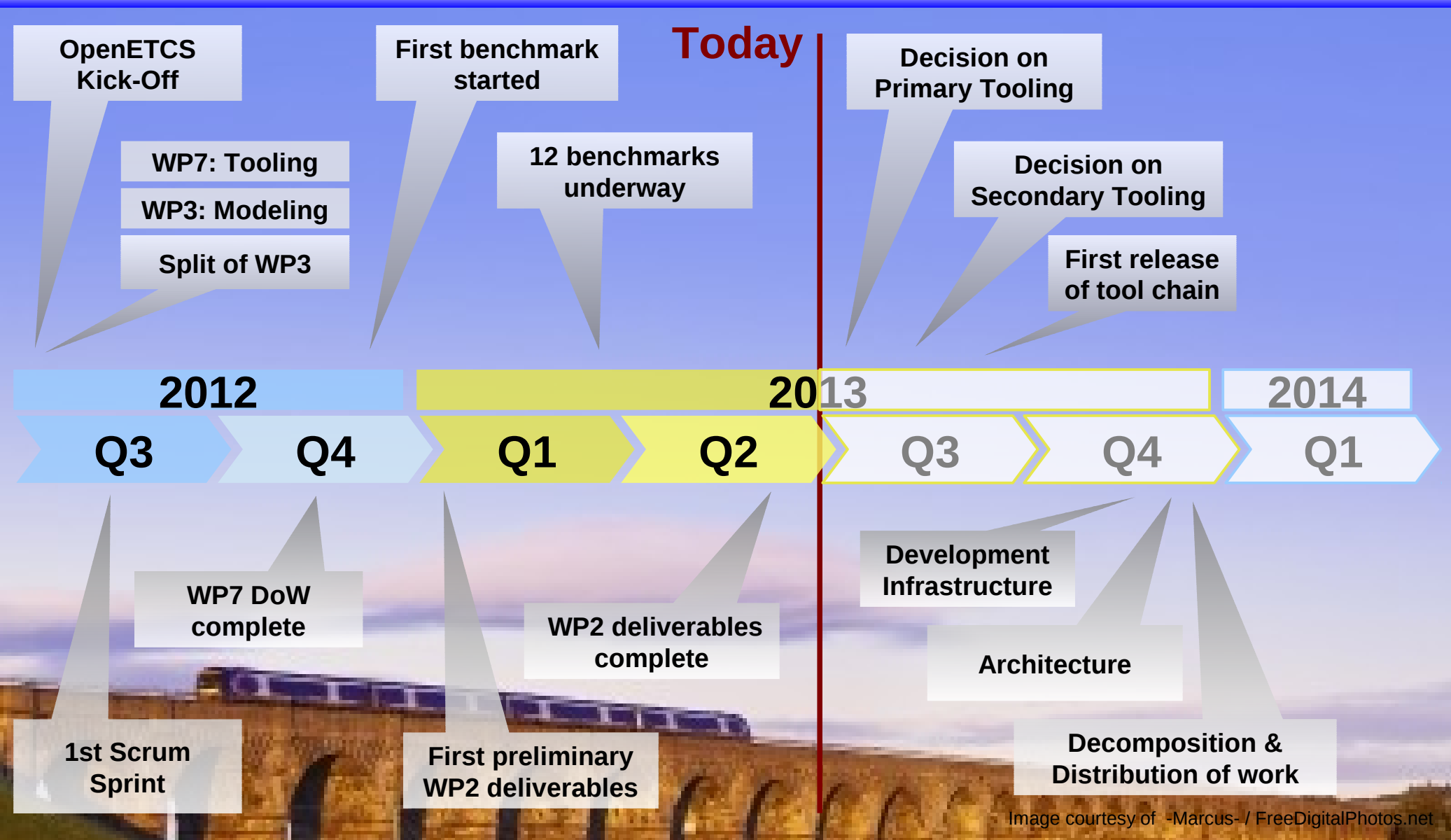
# Timeline



# Timeline

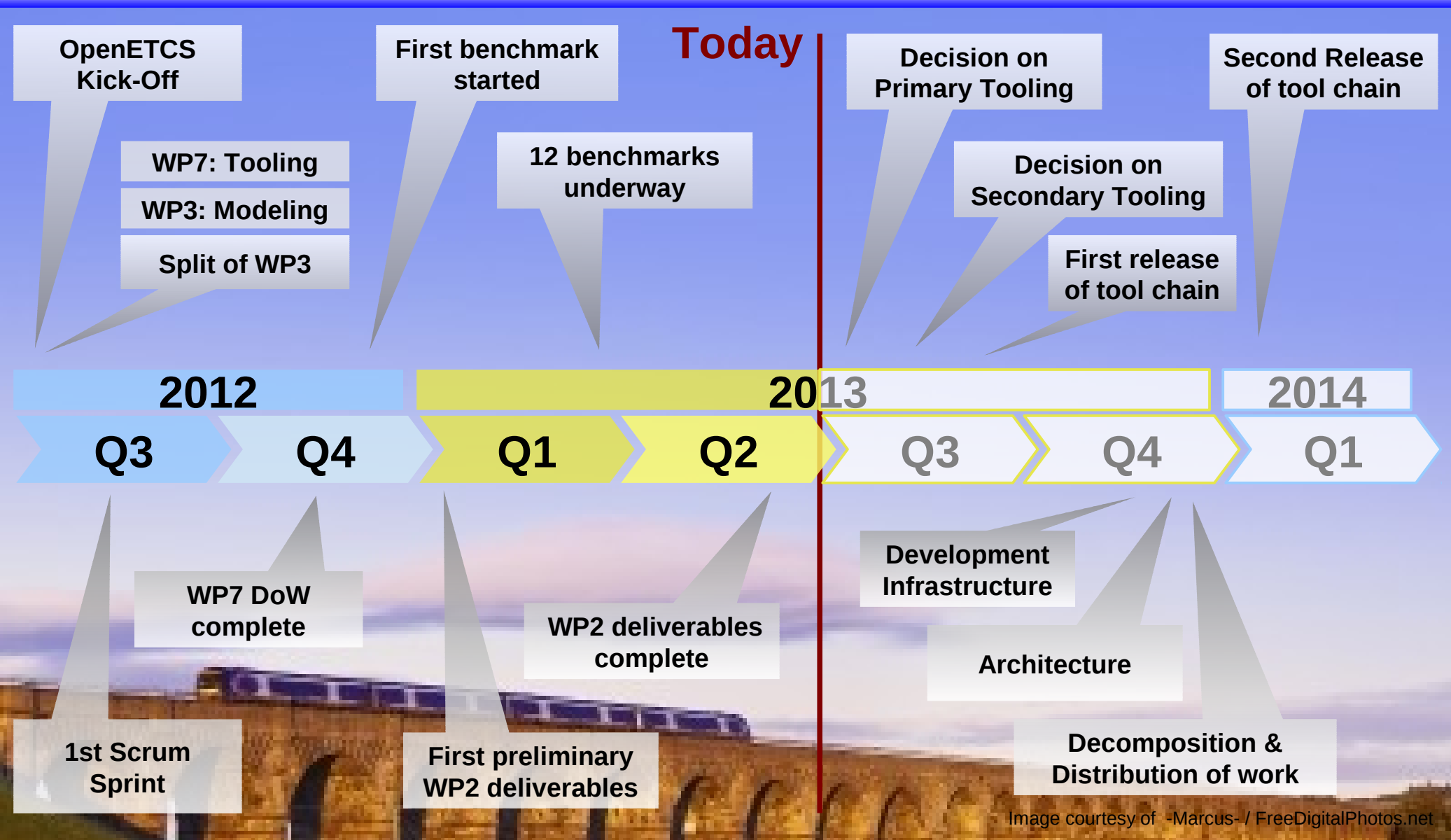


# Timeline

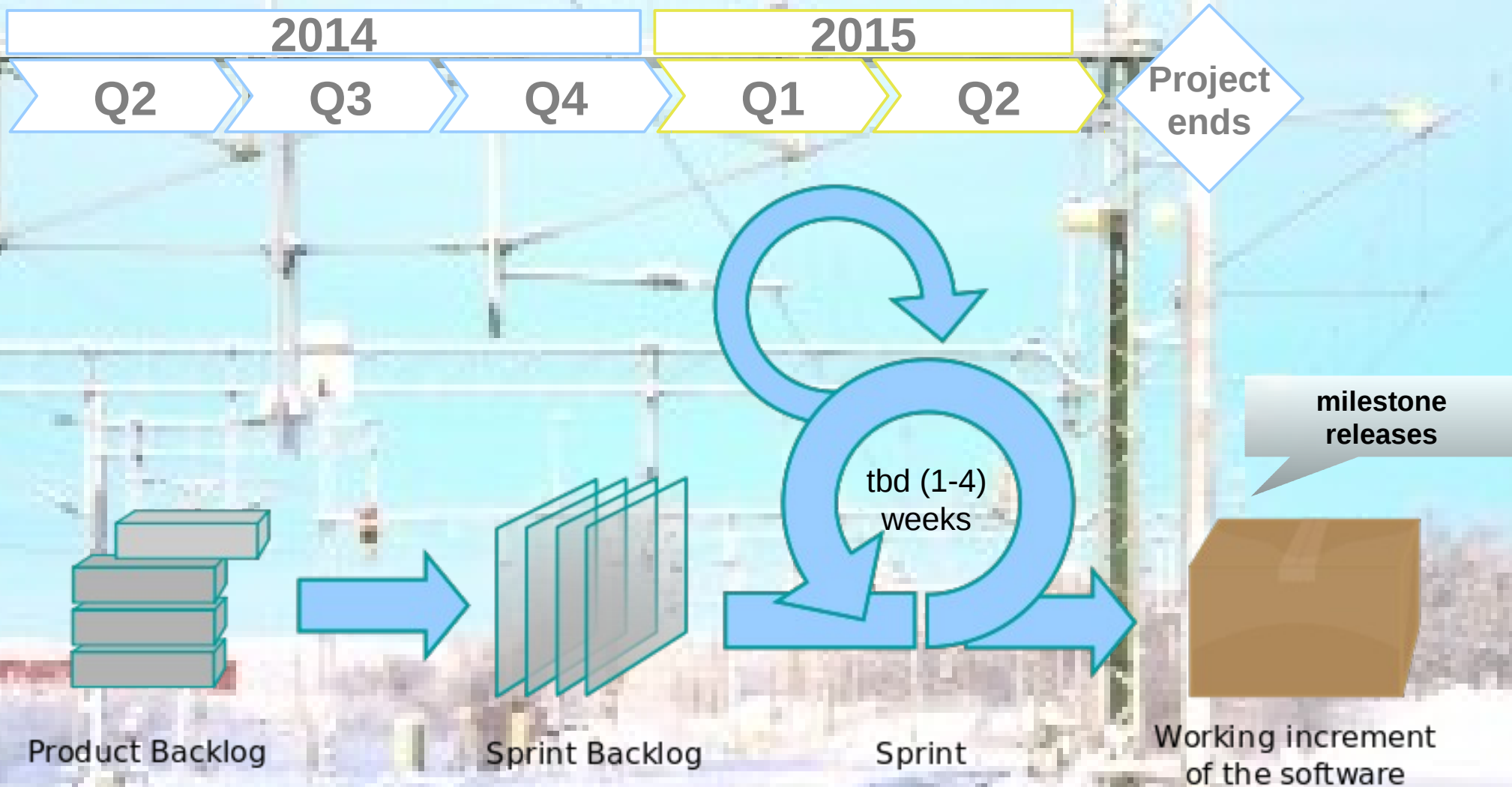




# Timeline



# 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

