

Impact of e-Infrastructures: Theories and practices of assessment methodologies

29 March 2012

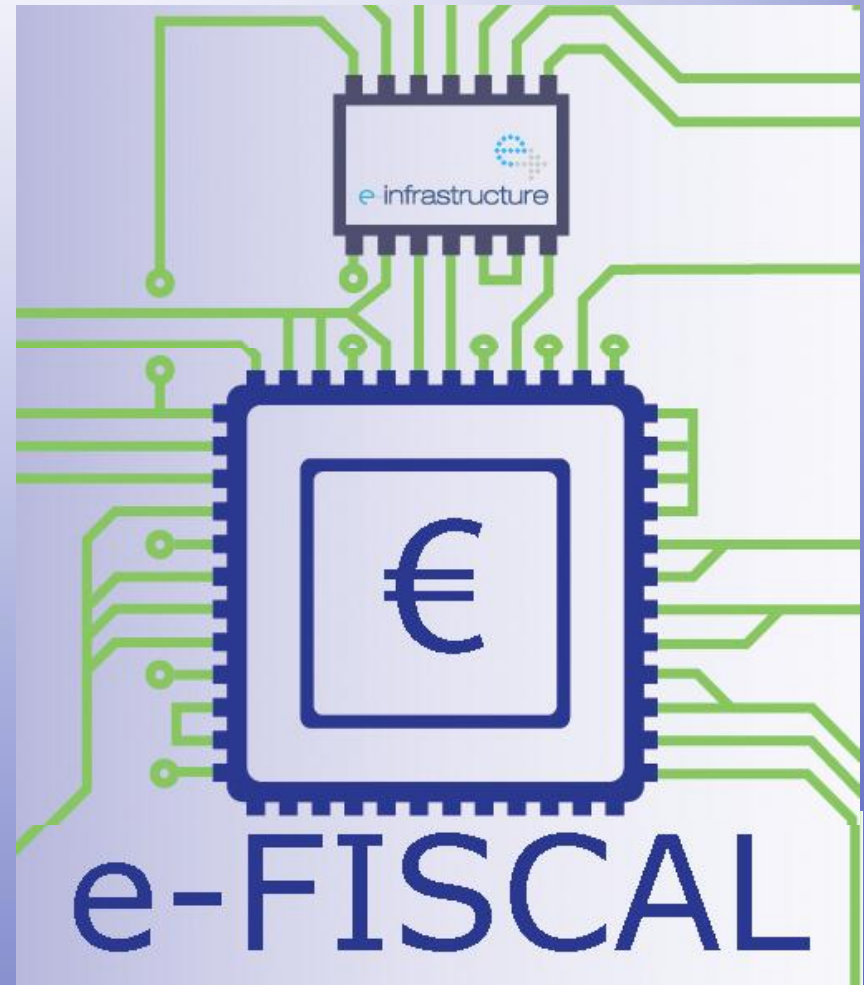
e-FISCAL: Costs of HTC and HPC infrastructures - results up to present

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It's all about
knowing the
costs..

...their
composition..

...and putting
them in context!



Main objectives

- **Analyse** the costs of the current European dedicated High Throughput and High Performance Computing (HTC/HPC) e-Infrastructures for research
- **Compare** them with the closest equivalent commercial leased or on-demand offerings
 - Cloud computing!
- **Evaluate** the findings through a report

Consortium



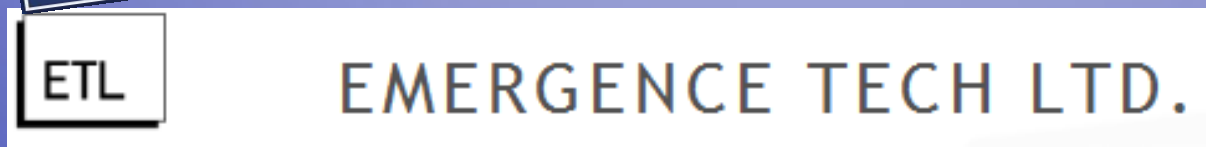
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EGI.eu



NUIG*
(ICHEC)



ETL

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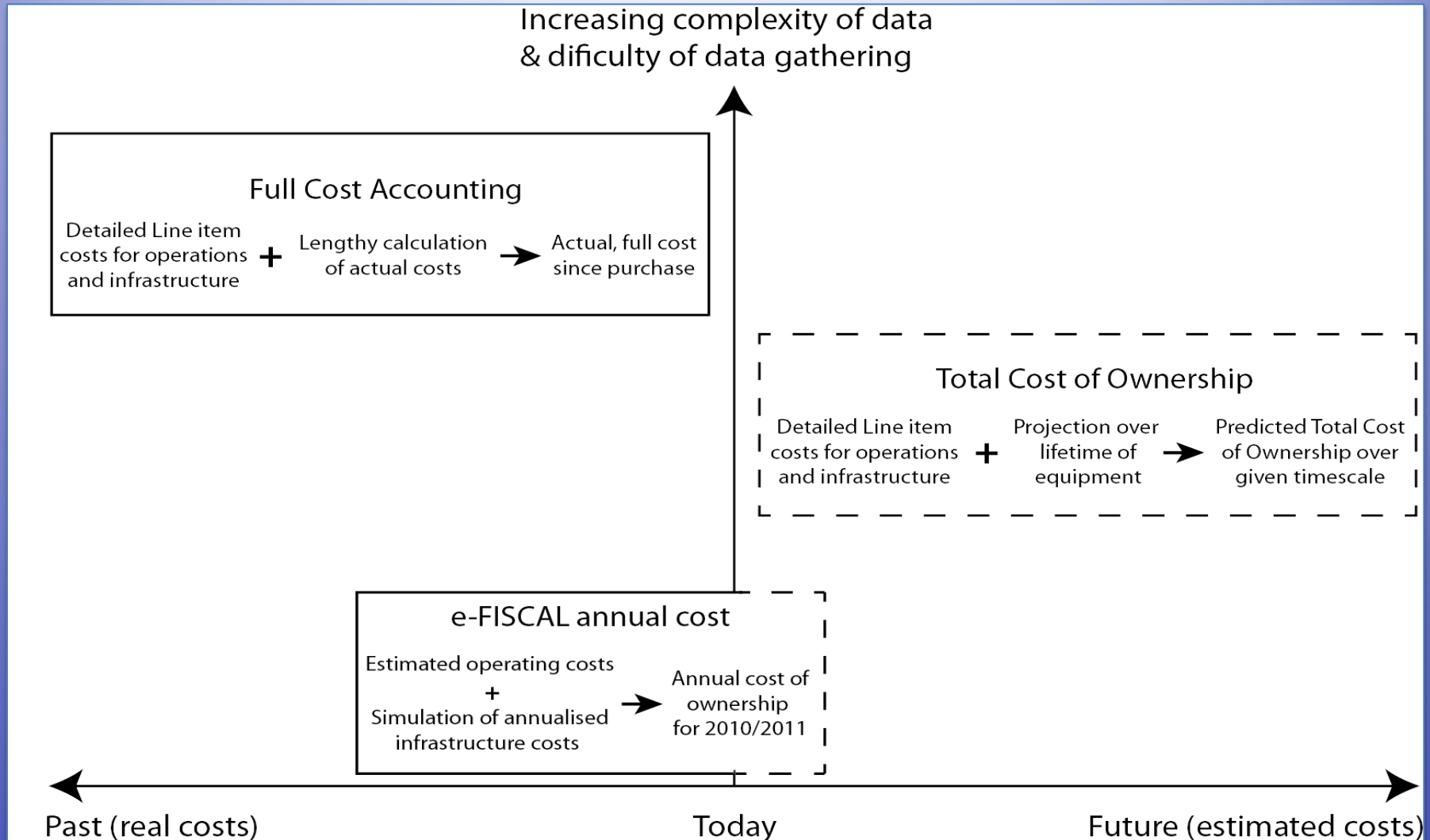
Background

- First in-depth study in Europe
 - Significant sample of participants, HTC/HPC, comparisons with Clouds
- Builds on previous financial exercise
 - e-IRGSP2 project
 - Dealt with HTC (Grids) only, small number of NGIs involved -> initial charting of the area
- e-IRGSP2 highlighted the complexity
 - Findings available at http://www.e-irg.eu/images/stories/e-irgsp2_d4_3_approved_by_the_consortium.pdf (look at deliverable second part)
 - Large range for overall cost estimate, **but** indicates EGI costs as competitive!

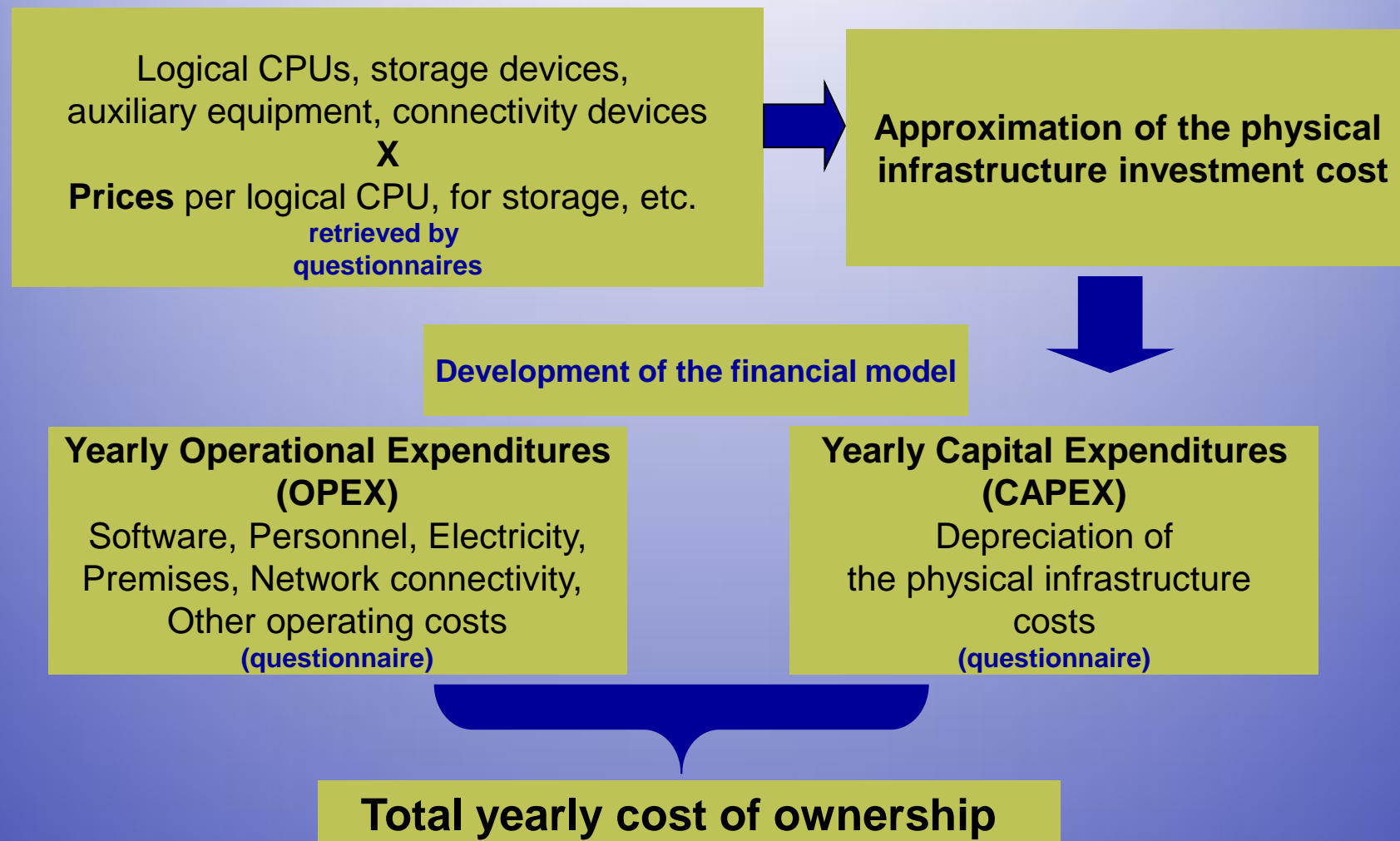
Overall approach

- 2-phases
 - 1st phase: Basic questionnaire
 - 2nd phase: In-depth discussions
- Survey launch Dec 2011 (www.efiscal.eu/survey)
 - Survey closed – but please contact us!
- Feedback received from:
 - NGI/PRACE country coordinators
 - Other HPC/HTC site managers
- Sustainability discussions
 - e-FISCAL workshop, expert/update groups

Methodology



Methodology



Contributing to sustainability and impact assessment

- Special attention:
 - Performance benchmarking with commercial clouds
 - Can't compare prices with costs! (e.g. profit margin possible)
 - Confidentiality/Anonymity of data!
 - Cross-checks/validation with market or other prices
 - Inclusion of considerations beyond "plain" cost
 - Trust, reliability, customer satisfaction...
- Outputs:
 - Generic cost model
 - Cost per CPU core, Capex/Opex ratio, Personnel per CPU core...
- Cost is different from value!

Confidentiality: more..

- Simple document prepared. Main points:
 - ***No identifiable data related to an individual site or national HPC/HTC entity will be presented***
 - all data will be summarised and appropriate metrics will be calculated only for groupings that are large enough to guarantee anonymity
 - Indicative metrics: cost per core hour, CAPEX/OPEX ratio, FTEs per core
 - Sample presentation available at www.efiscal.eu/survey/data-presentation

Cost per logical CPU/hour

Core = Logical CPU

	<i>Cost per Logical CPU/hour</i>	<i>% utilization</i>		
€/logical CPU hour	60%	80%	90%	
Min	0,065	0,052	0,045	
Max	0,152	0,135	0,100	

SAMPLE

Cost breakdown

<i>Overall cost breakdown</i>	
CPU depreciation	25%
Storage depreciation	14%
Interconnect equipment depr.	2%
Auxiliary equipment depr.	5%
Software costs	1%
Support contract costs	5%
Personnel costs	32%
Premises costs	8%
Electricity cost	7%
Connectivity costs	0%
Overhead costs	1%
Total	100%

SAMPLE

Capex =46%

Opex =54%

Results up to present

- State-of-the-art review
 - Reviewed 34 related papers available at <http://www.efiscal.eu/state-of-the-art>
- Benchmarking efforts underway
 - Comparison of EGI/PRACE infrastructures with Amazon
- Received 23 good quality surveys from 12 countries
 - Expecting some more ones requested extension
- Planning for the project summer workshop
 - 4 July 2012, Samos Island

e-FISCAL Summer Workshop

■ 4 July 2012, Samos Island, Greece

@ Samos Summit 2012 event series

<http://samos-summit.blogspot.com>



Thanks!

- All material and questionnaire available in www.efiscal.eu
- e-mail us at [info @ efiscal.eu](mailto:info@efiscal.eu) to and keep up with the project (update list)
- Detailed workshop information to be sent out very soon!



Project in a nutshell

- **Project acronym:** e-FISCAL
- **Contract n° :** RI-283449
- **Project type:** CSA-SA
- **Start date:** 01/08/2011
- **Duration:** 18 months (end 31/1/2013)
- **Total budget:** 392.523 €
- **Funding from the EC:** 349 999 €
- **Total funded effort in PMs:** 33.75
- **Web site:** www.efiscal.eu