EUROPEAN UNIVERSITY ASSOCIATION

REPORT

Accepting University Accounting Practices under Horizon Europe

A compendium of national and institutional cases

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Definitions

Actual cost	An identifiable and verifiable cost that was actually incurred and recorded in the accounts.
Certificate on the Methodology for Unit Costs (CoMUC)	European Commission certification that beneficiaries can use to declare direct personnel costs as unit costs.
Cost	The monetary value of resources used or liabilities incurred to perform an activity or service.
Direct cost	A cost that is directly attributable to an activity.
Full Economic Costing (FEC)	A full costing methodology based on activity-based costing developed by universities in the United Kingdom and Ireland.
Flat rate	A percentage of the eligible costs calculated for reimbursement purposes. For example, indirect costs are calculated as a percentage of the total eligible direct costs under Horizon 2020.
Full costing	The ability to identify and calculate all of the direct and indirect costs needed to accomplish each activity and/or project.
Indirect cost	Costs that have been incurred, but which cannot be identified and charged directly to each individual activity. Sometimes the term "overhead" is used to describe indirect costs.
Staff cost	Costs directly attributable to staff work. As these costs are calculated on the basis of payroll data they refer to the staff costs actually incurred by the beneficiary during a specific year.
Project-based funding	Universities apply for funds for a specific project. Applications are assessed according to how far they meet the funding criteria and/or on a competitive basis.
SUHF model	This full costing model is based on the costs included in the budget rather than actual costs. It was designed by the Association of Swedish Higher Education (SUHF).
TDI model	A common national full costing methodology designed in Norway to ensure the identification of the full costs of all activities related to externally funded research projects. This model is based on the notion that academic staff Time is the primary driver of both Direct and Indirect costs (TDI).
Time allocation	The allocation of time to different tasks and activities (e.g. research, teaching, etc). Many different techniques are used to allocate time, including staff surveys, interviews, sampling or profiling. Time is often measured as a proportion of total working hours rather than by measuring the exact number of hours spent.

Time recording	A method used to calculate the time spent on a specific activity, for instance through timesheets.
Transparent Approach to Costing (TRAC)	An activity-based costing methodology designed to identify the cost of research and teaching developed and applied by universities in the United Kingdom.
Unit cost	Costs calculated on the basis of a pre-determined fixed amount per unit. Horizon 2020 defines unit costs for staff as the average staff costs calculated according to the institution's normal accounting practices.

Acknowledgments

This compendium gathers information about the national and institutional accounting systems developed in several European countries from the late 2000s to the early 2010s and provides up-to-date information about their implementation. It builds on previous work conducted in the context of the EUIMA project and the EU Funding for Universities campaign organised by EUA.

EUA would like to thank the authors and contributors to the EUIMA project report: *Financially Sustainable Universities - Full costing progress and practice*. This report became the starting point for designing the country profiles featured in this compendium.

EUA is extremely grateful to all the contributors to this report for sharing their experiences and knowledge of the accounting practices used for managing EU and nationally funded competitive research programmes in their countries and institutions. EUA is also thankful for their availability to provide up-to-date information about the development and implementation of full cost accounting methodologies in their countries. Together with an analysis of how these practices could be applied to the financial management of EU funded projects, this information provides a strong basis for improving the alignment of European and national financial management practices.

Finally, EUA would like to acknowledge the support of its members and the simplification group experts, who made several contributions to drafting this report.

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Introduction

Simplification of EU funding management has attracted considerable attention during preparations for Horizon Europe - the future EU Framework Programme for Research and Innovation. Despite the progress achieved in the Horizon 2020 Rules for Participation, there is still a lot to do to accomplish impactful simplification for the next generation of EU funding programmes.

EUA understands simplification of EU funding to mean, "*the achievement of a coherent set of rules that take the diversity of actions and beneficiaries covered by the programme into consideration, and that ensure both quality processes and effective use of resources*"[1]. Universities are the biggest beneficiaries of Horizon 2020 and comply with various funding programme rules as a result of their involvement in diverse regional, national and European schemes. Universities are therefore a key stakeholder to consider when developing these processes, in order to increase the added value and impact of EU funds.

Missed opportunities to further simplify the management of EU funds directly translate into significant costs at all stages of the project life cycle. Under Horizon 2020, low success rates lead to the waste of top research ideas and new scientific discoveries. They are also a major source of inefficiency for applicants and public funders who ultimately bear the costs of unfunded applications. Specifically, the Commission's Horizon 2020 Interim Evaluation found that only 11.6% of Horizon 2020 proposals received funding, whereas 18.4% had been funded under the 7th Framework Programme (FP7). Moreover, the proliferation of information in the Horizon 2020 Annotated Model Grant Agreement has led to high error rates during project implementation phases, increasing the risks of participation and hampering access to the programme.

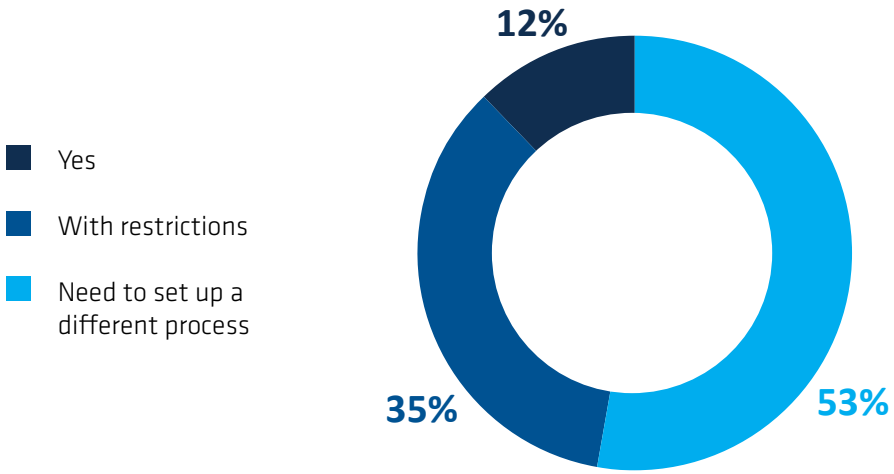
As argued in the paper *Taking simplification of EU funding to the next level - the university perspective*, EUA acknowledges improved acceptance of nationally recognised institutional accounting practices as the simplification with most impact for EU funding beneficiaries. In a complicated funding landscape, simplification is first and foremost about reducing the mismatch between EU funding requirements and institutional financial management systems. Therefore, greater vertical alignment between European, national and regional programmes as well as improved horizontal alignment between the various EU funding schemes would significantly reduce the administrative burden of managing EU funded projects. EU funding beneficiaries are also very varied, which means that simplification cannot be achieved by a single set of rules, but rather through the provision of several options to accommodate different needs.

Despite recent changes to the Model Grant Agreement (MGA) that allow a certain degree of acceptance of institutional accounting practices, the EUA member consultation on the Horizon 2020 mid-term review showed that participants struggle with their implementation. Over two thirds of respondents still cannot apply their institutional accounting practices fully when it comes to internal invoicing and personnel unit cost calculations.

1 EUA (2018), Taking simplification of EU funding to the next level - the university perspective, Brussels, February 2018.

Figure 1. Use of institutional practices for cost accounting under Horizon 2020

Were you able to use institutional accounting practices to manage Horizon 2020 projects?



Source: EUA Member Consultation. A Contribution to the Horizon 2020 Mid-Term Review, 2016.

Broader acceptance of institutional accounting practices is best achieved by embracing a trust-based approach, implying greater flexibility in accepting different eligible costs across the EU. Universities are established institutions with professional financial management procedures that are regulated and audited at national level. In several EU countries, full costing methodologies[2] allowed beneficiaries' costs to be calculated transparently and accurately, which led to national public and private funders being able to accept institutional accounting and management practices.

Following in the footsteps of national competitive research programme funders, EU policy makers should rely increasingly on the accounting practices developed by the university sector in several European countries. This could be achieved by providing a choice of options, which could include certification of the national methodology used to report the costs incurred under EU funded projects. Institutional accounting practices could also be certified at the launch of Horizon Europe using a transparent and suitable procedure with the potential to substantially improve the conditions for programme participation. This would be particularly relevant to institutions that manage several projects, using sound accounting and management practices approved by national funders.

The measure that came closest to this acceptance principle was the ability to apply for institutional methodology certification under FP7. Although the ability to have costs reimbursed on the basis of a certified methodology instead of a flat rate provided a strong incentive to develop full costing models, this option failed to convince due to the excessively burdensome rules imposed on beneficiaries.

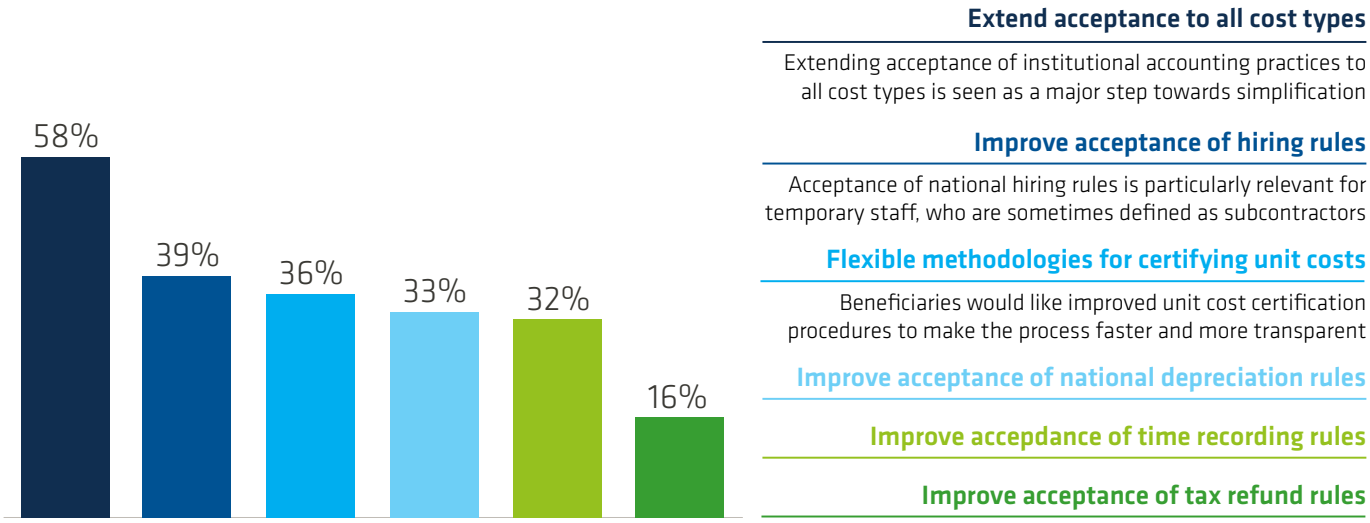
Attempts by an entire sector to apply for FP7 certification (e.g. in Austria and in the United Kingdom) were also criticised due to the failure to agree on a compromise over the eligibility of costs, despite the potential for considerable economies of scale and increased efficiency. TRAC EC-FP7 aimed to adapt the UK TRAC model to FP7 requirements for British universities but institutions found it too complex to use.

An improved Horizon Europe based on existing Horizon 2020 participation rules must at the very least allow beneficiaries to select the option best-matched to their own processes. This would also ensure a degree of continuity between the two programmes and ease EU project management for institutions that have already adapted their models to Horizon 2020. As Figure 2 shows, there is room to improve the current model by extending the eligibility of additional cost types, and by simplifying unit cost calculations and time recording rules.

2 Full costing is defined as the ability to identify and calculate all of the direct and indirect costs needed to accomplish each activity and/or project. (EUA 2013).

Figure 2. Proposals to improve acceptance of institutional accounting practices

Which of the following measures could help improve acceptance of institutional cost accounting practices?



Source: EUA Member Consultation 2017-2018: Impactful Simplification of the EU Framework Programme for Research and Innovation.

This compendium aims to contribute to the transparency of the discussions that promote broader acceptance of institutional practices as a major step towards simplifying EU funding. It presents a selection of accounting and management practices developed at institutional or system-level in various European countries. Most use sound costing methodologies as an effective management tool that ensures financial sustainability, internal control and transparency at institutional level. National public funders therefore accept them when it comes to reimbursing competitive research programme costs. At European level, recent changes to the Financial Regulations applicable to the general budget of the Union opened up concrete opportunities to establish procedures that involve a broader acceptance of standard accounting practices.

The compendium is divided in two parts. The first provides examples of accounting methodologies developed by the university sector. In many cases these were designed with stakeholders including regulators and funders. National public and private funders therefore accept these methodologies as the basis for reimbursing beneficiaries' competitive research project costs. The second part highlights cases in which several institutions use similar methodologies. Several of these models are also accepted and audited by national funders. This means that they are both reliable and securely based on the national regulatory framework.

The cost accounting models reported at the beginning of each country profile were developed in the late 2000s and early 2010s and have since been further improved. Except for the Norwegian case, the descriptions of these models were originally published in the EU-funded EUIMA project report and have been updated to include the latest sector developments.

The country profiles also feature tables providing technical information about specific institutional accounting practices and how these could be applied for EU funded projects. As they refer to procedures implemented at selected institutions (except for the Norwegian country profile), other institutions in the same country may have different experiences, even if they use the same or similar practices. Gaps in a table indicate that this information is either not available or not applicable to the specific cases described.

The comparison of institutional practices to current Horizon 2020 rules aims to investigate opportunities to align Horizon Europe with standard institutional procedures so as to reduce the administrative burden and improve cross-reliance on audits. Some examples show that the acceptance of institutional practices had a major impact on simplifying auditing procedures at national level (Austria, Ireland and the United Kingdom).

Part 1. National accounting practices accepted by competitive research programme funders

AUSTRIA

The development of a costing model at Austrian universities

Austrian universities started to develop a system-wide costing model in the 2000s. New national obligations and changes to the 7th EU Framework Programme reimbursement rules were major drivers for developing a methodology based on full costing.

National regulatory reforms effective from the 1st of January 2004 changed Austrian universities' legal status to that of autonomous legal entities. The prerequisites needed to implement this major reform included the use of a comprehensive financial software programme, double-entry bookkeeping and structural changes. Every university was obliged to install a commercial accounting system, including income and expenditure accounting, and a reporting system. Externally funded research also had to be fully covered by the funding programme.

2006 saw the development of an indirect costs calculation method that aimed to reconcile national and international financial rules with the management and accounting principles used by universities. A task force comprising Austrian university finance and research staff evaluated the method and the Austrian rectors' conference agreed to promote it. The model was also meant to receive the European Commission certification for calculating indirect eligible costs under FP7.

However, the unified approach was abandoned in 2007 for various reasons and due to different obstacles, including: management changes, uncertainty about the FP7 methodology certification process, fear of making mistakes in interpreting regulations and the different sources of funding for university research. Since then individual universities have adopted different approaches to developing an appropriate system for tracking the costs of teaching, research and other activities, and implement it according to their own abilities, needs and conditions.

In the early 2010s, the discussions about major changes to government funding involving the separation of teaching and research funds brought full costing back to the fore. A working group comprising representatives of the Ministry of Higher Education and Research and university spokespeople was tasked with laying the foundations for a new funding system. One of its recommendations was to base funding for teaching on the number of active students. Calculations were partly based on the full costing models already in place at some Austrian universities. The debate on higher education funding was further revived during the EUIMA-Full Costing Country Workshop, held in Vienna in February 2011.

More recent developments include the adoption of a regulation on standardised costing published in March 2017. This resulted in an ongoing project implemented by Austrian universities. The objective is to establish monetary and non-monetary reporting standards that can be met by every university. The first phase of the project will result in systems and software adaptation. The second phase will focus on the reasonability and evaluation of the reported data.

Accounting practices accepted by national research programme funders

The information reported in the following table describes accounting practices at the Medical University of Innsbruck. Information specifically referring to Universities of Applied Sciences refers to practices at the FH JOANNEUM University of Applied Sciences.

Calculation of the Different Cost Items to be Reimbursed	Description of the Accounting Practice Used	Can Nationally-accepted Practices be used for EU Funded Projects
1. Staff cost calculations		
a. Description of eligible staff cost elements and calculation methods (salary components, sick leave, holidays, pension, etc.)	Staff costs are calculated on the basis of the gross-salary plus any fringe benefits. Due to the complex salary system (civil servants, collective agreements, etc.) cost eligibilities differ from one salary group to another. Generally speaking, the decision depends on the part of the salary under scrutiny, e.g. whether it involves the basic statutory salary (overpayment is accepted in case of necessity) or supplementary fees for clinical work or teaching. Costs related to clinical work, teaching and side contracts are ineligible. If side letters have been signed for the project, then only these costs are eligible. One-off payments are not eligible.	The same practises are used for national and EU funded projects.
b. Use of unit costs or other options to reimburse staff costs	Unit costs are not calculated or applied under national funding programmes.	N/A
c. Staff cost calculation period (actual, past year, etc.)	Staff costs are calculated for the actual period of the claim.	
d. Description of how staff time is accounted for/recorded (timesheets, profiles, fixed time, contract, etc.)	Project staff provide timesheets. Hourly rates are determined by dividing the costs by the number of productive hours. Alternatively, the yearly divider of 1680 hours (until 2014) or 1720 hours (since 2015) is accepted where full time recording is not available. At Universities of Applied Sciences (UAS), daily rates are calculated based on a yearly divider of 1290 hours, where no basic research funding is in place at the institution. This divider is accepted by the Austrian Research Promotion Agency (FFG), although other yearly dividers are used by other (Austrian) funding programmes use other yearly dividers.	No adjustment necessary.
e. Statements and documents to justify staff costs	The following documents are requested: employment contracts, timesheets, pay roll, hourly rate calculation information.	The same documents are presented for EU projects.
2. Other direct cost calculations		
a. Equipment (depreciation: amounts and time, etc.)	Depreciation is calculated monthly based on purchase prices in line with the university's normal accounting principles.	No adjustment necessary.

b. Infrastructure (recorded as a direct cost, depreciation, etc.)	Infrastructure costs are usually ineligible unless specifically/separately applied for. Specific infrastructure needed to implement the scientific programme (not just office facilities or premises) is eligible for funding under some Austrian Research Promotion Agency (FFG) schemes. In 2016 Austrian national and regional funds introduced new funding schemes for excellent research infrastructure. Under these schemes, and contrary to the usual funding practices, full purchase costs including initial operation costs are eligible up to a certain rate, depending on the infrastructure type and planned use. Up to 85% of the cost of scientific infrastructure is reimbursed, whereas 50% of commercial infrastructure is reimbursed. In the latter case the remaining amount cannot to be covered by University/ HEI funds but must be paid for by private third parties.	N/A
c. Other Direct Costs	Other Direct Costs are reported using the relevant invoices.	No adjustment necessary.
3. Indirect cost calculations		
a. Description of the calculation of indirect costs including cost drivers	FFG established a 25% flat rate to cover all indirect costs. It is calculated as a percentage of total direct costs except third party contributions.	The indirect costs for Horizon 2020 projects are also covered by a 25% flat rate.
4. Internal invoicing		
a. Description of internal invoicing procedures	Internal invoices are issued by the service provider. They are usually priced below market rates to avoid reimbursement issues. Full cost calculation has not yet been implemented but is planned.	N/A

Auditing and Control	Description of National Funders' Auditing Practices	Similarities and Inconsistencies Between EU and National Auditing Practices
1. Description of procedures, audit types, reporting deadlines, etc.	FFG recently adopted new accounting and auditing procedures to improve the financial sustainability of their funding instruments. It is a good example of funders aligning with the regulatory specificities of the sector. The funder carries out two different types of auditing procedures. The most common procedure is a project-based audit, however selected beneficiaries can use systems audits. These comprehensive audits are carried out once a year and cover various institutional practices (including quality management systems, financial management and approval processes, strategic management issues, etc). The ability to audit institutional procedures rather than single projects was a real improvement for beneficiaries. It allows for greater institutional autonomy, responsibility and helps reduce indirect administrative costs.	Inconsistencies in EU and national auditing practices generally result from EC auditors' unfamiliarity with national laws. This is particularly true of salary cost calculations.

FINLAND

The development of a cost accounting methodology at Finnish universities

In Finland, national funders' acceptance of institutional accounting practices is based on full costing. European and national funding schemes were the main drivers for implementing this methodology.

Finnish universities are required to report to the Ministry of Education on how their income and expenses are allocated to teaching, research, artistic endeavours and societal activities on an annual basis, since 1997. Universities introduced a system of activity-based costing that includes a system for working time allocation to be able to fulfil this obligation properly.

The European Commission's 7th Framework Programme (FP7) was another important driver of full costing as its specific rules on cost reimbursement sent a strong signal to national funders.

In annual negotiations with the Ministry of Education the Academy of Finland, one of the two major Finnish research funding bodies, agreed to accept full costing methodologies in its reimbursement regulations from 2009. The other major research funding body Tekes (currently Business Finland) made the same decision and allowed full cost budgets as early as 2008. This removed one of the major obstacles to implementation, and convinced university staff of the need to implement full costing in order to increase external funding reimbursements. Eventually a model that satisfied all parties was agreed.

The tight schedule introduced by the Academy of Finland represented another challenge. As of 2009, research funding applications had to use a full costing methodology. Universities had only six months to establish the methodology and calculate salary add-ons and general indirect cost rates. Universities had to adapt to the major changes introduced by national higher education reform, including several university mergers, at the same time. This combination made inter-university cooperation difficult. Each university created its own full costing model, instead of working towards a common national model. Despite receiving little support from the Ministry of Education, most universities established a full costing methodology and time allocation system by the end of 2009.

As a result of the lack of cooperation between universities and funding bodies, in 2010 Universities Finland (UNIFI; formerly the Finnish Council of University Rectors) expressed its concern over problems encountered during the implementation of full costing methodologies, which were mainly related to funding applications, reporting, invoicing and work time allocation. In response, the Academy of Finland established a working group comprising representatives from universities, the Academy of Finland and the Ministry of Education and Culture,and tasked it with suggesting a number of simplifications and clarifications. The main outcome was the publication of a 2011 report (that drew on the 2008 EUA report on full costing,) containing 20 specific recommendations. Finnish universities used the report as a guideline to implement full costing. In 2015, the Academy of Finland evaluated the impact of the implementation of full costing, resulting in a number of further recommendations.

Today all Finnish universities use a full costing methodology and national working groups have made recommendations on the issue. The background to this work was a model total cost methodology for jointly financed activities drafted by a working group set up by the Ministry of Finance, and its report: Accounting of total costs and financing jointly financed activities based on total costs (2007).

Finally the Ministry of Education issued a binding regulation on full costing in 2016. The regulation defines elements including eligible and ineligible costs, allocation principles and audit requirements. It applies to all universities and universities of applied sciences. As a result, the models Finnish universities use now are quite similar. Working time allocation, which

was one of the most difficult aspects of implementing full costing, is now an established practise.

Although full costing is still not used to its full potential or as a strategic tool, cost-awareness among staff, especially heads of departments has increased. For instance, decisions concerning the ability to take on a project and its implications are now taken more consciously, and consider how it is funded, how much self-financing is required and what added value it represents for the university. Furthermore, further national coordination measures have been taken to standardise the implementation of full costing.

Acceptance of the model by national funders

Full costing is used, for example, when applying for, invoicing and reporting on external funding provided by the Academy of Finland and Tekes. In general, full costing typically applies to all external funding, if the funder sets no other guidelines. However, the complexity of the certification process for FP7 reimbursement, which was based on a full costing methodology, meant that no Finnish university applied for certification. All FP7 university beneficiaries used the flat rate. More recently, some Finnish universities, including Aalto University, applied for unit cost certification under Horizon 2020. However, they have reported long processing delays and a lack of information and transparency about the procedure.

Accounting practices accepted by national research programme funders

The table includes information about practices at the Aalto University and the University of Helsinki.

Calculation of the Different Cost Items to be Reimbursed	Description of the Accounting Practice Used	Can Nationally-accepted Practices be used for EU Funded Projects
1. Staff cost calculations		
a. Description of the elements of staff costs eligible for reimbursement and how they are calculated (salary components, sick leave, holidays, pension, etc.)	At Aalto University, monthly staff costs include direct salary costs and indirect personnel costs. Direct salary costs are calculated monthly based on how long each person actually worked on the project (information taken from the time recording system) and the actual monthly salary (information taken from the HR system). Only time actually worked is charged to the project. Sick leave, holidays and time spent on other tasks are excluded from project accounts. Indirect staff costs are a percentage multiplier calculated on the basis of the previous financial year. Indirect staff costs comprise statutory employer expenses such as: holiday compensation, holiday pay, pension expenses, social insurance expenses, disability and life insurance, unemployment insurance, daily allowances, social security expenses, and statutory occupational healthcare.	Aalto University will be able to use its institutional practices for EU funded projects if the Horizon 2020 CoMUC application is approved (please refer to point 1.b.).
b. Use of unit costs or other options to reimburse staff costs		Some Finnish universities are seeking to certify their existing methodology through the Horizon 2020 CoMUC procedure. Certifying unit costs using this methodology would allow them to be used in EU funded project accounts and would therefore substantially reduce administrative burdens. However, universities report very long delays in processing the application (over 16 months at the time of drafting this report in April 2018) and a lack of information and transparency about the procedure.
c. Staff cost calculation period (actual, past year, etc.)	Aalto University calculates direct salaries monthly, whereas indirect costs are calculated yearly on the basis of the previous financial year.	Staff costs are calculated on the basis of the previous financial year.

d. Description of how staff time is accounted for/recorded (timesheets, profiles, fixed time, contract, etc.)	The University of Helsinki introduced SoleTM - an online time recording system in 2007. SoleTM is integrated with the data warehouse and is one of the major systems providing full costing information. At university level, working time is allocated to teaching, research, societal interaction and administration. Each unit can establish an indefinite number of sub-tasks under each main activity for internal purposes. Only staff members working on externally funded research project record their time on a daily basis. Working time for other staff is mainly allocated on the basis of work plans and profiles. No additional recording is required, and plans can be revised during the year if there are major changes to the proportions of teaching and research. Academic staff members have an annual workload of 1600 hours, in accordance with the collective agreement between university employers and employees (2010-2012). Aalto University employees use the Halli system to record the actual work hours spent on a project. All Aalto University employees involved in externally funded projects report their actual work hours per project and per day, on a monthly basis. Teaching staff who do not work on externally funded projects report a summary of their hours once a year. Employees record their working hours on the basis of the actual time worked on a project. Working hours are recorded on a daily basis, and the number of hours and minutes for the corresponding project is recorded. Salary allocation combines an employee's Halli information about the actual time worked on each project with the employee's salary information from the HR system. The actual salary is divided up per project based on their reported working hours and then multiplied by the indirect personnel cost multiplier (see section 1.a.) to obtain the indirect staff costs for the project.	At the University of Helsinki, academic staff members working on externally funded projects must record the time spent on these projects daily through the SoleTM system. The allocated hours for each person are subsequently matched with his/her salary in the data warehouse, and the salary costs allocated to the projects accordingly. The SoleTM system provides options for pre-recording and profiling, if the time used on certain projects remains the same over a longer period. The system provides the timesheets that must be supplied to funding agencies. Aalto University will be able to apply its institutional practices for time allocation to EU funded projects if the Horizon 2020 CoMUC application is approved.
e. Statements and documents to justify staff costs	Timesheets, employment contracts, bookkeeping.	No adjustment necessary.
2. Other direct cost calculations		
a. Equipment (depreciation: amounts and time, etc.)	Equipment reimbursement procedures vary between national funding agencies, which fund either depreciation or total investment. Depreciation periods are defined by the organisation's accounting principles.	N/A
b. Infrastructure (recorded as a direct cost, depreciation, etc.	Accounted as direct costs (see point 2.c).	N/A

c. Other Direct Costs	At Aalto University, Other Direct Costs include research infrastructure facilities, travel, office supplies, small equipment, etc.	N/A
3. Indirect cost calculations		
a. Description of calculation of indirect costs including cost drivers used	Finnish funders accept the indirect cost multiplier used to calculate staff costs (direct salaries + indirect personnel costs) at Aalto university. The multiplier is calculated using working time allocations from the time recording system and functional costs as cost drivers.	The average indirect cost multiplier applied at Aalto University is about 80% on top of staff costs. The 25% flat rate covers about half of the indirect costs calculated on a full cost basis.
4. Internal invoicing		
a. Description of internal invoicing procedures	A large proportion of internal invoicing at Aalto University concerns the use of research infrastructure facilities such as clean rooms. Costs related to the use of these research facilities include the salaries of the staff working at these facilities, consumables, equipment depreciations and maintenance charges. The hourly price for using these facilities includes the above costs. This price is invoiced internally and re-invoiced to national funders. All of the costs related to the use of these research facilities (except maintenance) can be measured directly as they are generated at a specific facility. Maintenance charges include building depreciation and maintenance, cleaning, and utilities costs, which are invoiced by the square meter by building and by university subsidiary/affiliated company.	Although accepted by national funders, EU funders may not accept this practice.
Auditing and Control	**Description of National Funders' Auditing Practices**	**Similarities and Inconsistencies Between EU and National Auditing Practices**
1. Description of procedures, audit types, reporting deadlines, etc.	Aalto University is audited by project auditors (PwC), regular auditors (KPMG) and EU auditors. A standard audit is performed every year. National research funding agencies require project audits when project costs are over 500,000 euros (Business Finland) or 1 million euros (Academy of Finland). The National Audit Office may perform additional audits.	EU project audits are performed on a case-by-case basis and could make more use of cross-reliance.

IRELAND

The development of the Irish FEC accounting model

The seven Irish universities developed their accounting practices with a Full Economic Cost (FEC) model initiated collectively in 2006. The full costing project started in early 2007 and was completed in June 2011.

The Irish government encouraged the process through the Higher Education Authority (HEA), the state higher education funding agency that initiated a Strategic Innovation Fund (SIF) to support reform and innovation in the Irish higher education system.

Growing pressure on university finances because of increasing participation rates and research activities, advances in technology, increasing pay and pension costs and new societal demands was a major driver for developing and implementing full costing. It became clear that to address underfunding and sustainability concerns, the university sector needed to collect clear data to support policy making, and particularly provide evidence to support the case for additional funding. From a funder's perspective, full costing was seen as an accountability tool that would deliver greater transparency and comparability. Universities saw the development of a full costing system as a key management information tool that would allow them to identify and understand the cost of their activities and thereby support strategic decision-making.

The Irish Universities Association (IUA) successfully applied for SIF programme funding to develop a full costing framework for the sector. Approximately 2 million euros was awarded. This support was a key factor enabling the development of full costing in Ireland.

The FEC model has now been embedded at universities in Ireland and is consistent across the seven Irish universities. The model allocates all costs to the university's primary activities: teaching, research and other activities. FEC outputs are produced on an annual basis and reported to the HEA. Refinements have been and are made to address any issues that emerge. These are managed and agreed centrally in order to protect the consistency and comparability of the outputs.

Box 1. The Irish FEC model

The process of cost accounting can be divided into six-stages:

Stage 1: costs/resources are identified from the financial statements and then two agreed and FEC-specific cost adjustments and a number of other adjustments (e.g. pensions) are made to enable the comparability of outcomes. The specific FEC adjustments are:

I. Financing and investment – to cover the cost of borrowing (interest), the opportunity cost of institutional cash used for financing and a surplus for the rationalisation and development of the institution's business capability and capacity.

II. Infrastructure – to reflect the full long-term costs of maintaining safe, productive infrastructure to the standard required to remain competitive.

Stage 2: FEC costs are allocated to academic units (e.g. faculties, schools and disciplines in the case of Trinity College Dublin) using agreed common cost drivers. For example:

- IT via three pools – (i) costs specific to an academic unit going directly to that unit, (ii) infrastructure costs based on square meters and (iii) all other costs allocated on the basis of staff and student full time equivalents (FTEs).
- Premises/estates by weighted square meters with the weighting determined by the type of space occupied i.e. highly serviced laboratory, laboratory, classroom/office space, and storage/shed space.
- Central administration – there are five central administration cost pools: student-related costs, staff-related costs, international student-related costs, research related costs and all other costs; with a different cost driver for each pool.

Stage 3: FEC costs per academic unit are allocated across three categories (teaching, research and other), which are further sub-divided into nine academic activity cost pools. This allocation is driven primarily by the Academic Activity Profiles (AAP), which are compiled by academic staff and are one of the key drivers used in the FEC process. Other drivers include AAP staff costs (based on the staff costs within an academic unit, which are generally based on the AAP-percentage mentioned above), student FTEs, head of area estimates, etc.

Stage 4: AAP 9 – administration and management costs are allocated over all other eight academic activity cost pools driven by AAP staff costs.

Stage 5: AAP 5, 6 & 8 – research (no external sponsor with output, other research and scholarly activity) and clinical service costs are allocated to the three teaching/academic activity cost pools, driven by student FTEs.

Stage 6: full economic cost outcomes are produced giving:

- Cost per student FTE as per HEA (Higher Education Authority) subject category (AAP 1, 2 and 3)
- Research indirect cost rate (AAP 4)
- Total university cost of other income generating activities (AAP 7)

Accounting practices accepted by national research programme funders

The information included in the following table refers to practices applied at Trinity College Dublin (TCD).

Calculation of the Different Cost Items to be Reimbursed	Description of the Accounting Practice Used	Can Nationally-accepted Practices be used for EU Funded Projects
1. Staff cost calculations		
a. Description of eligible staff cost elements and calculation methods (salary components, sick leave, holidays, pension, etc.)	Gross salary, national insurance and pension are included in staff cost calculations. Only actual costs are claimed. These are calculated for the duration of the project.	No adjustment necessary.
b. Use of unit costs or other options to reimburse staff costs	N/A	Trinity College Dublin did not apply for CoMUC under Horizon 2020. The certificate is not relevant considering the full costing system implemented.
c. Staff cost calculation period (actual, past year, etc.)	Staff costs are calculated based on the actual duration of the financial claim.	It is not possible to apply the same practice to EU projects, as costs have to be calculated monthly.
d. Description of how staff time is accounted for/recorded (timesheets, profiles, fixed time, contract, etc.)	In general no timesheets are required for the allocation of staff costs.	Timesheets and time declarations required.
e. Statements and documents to justify staff costs	Pay slips, gross-to-nets, bank statements, and staff contracts.	The same statements and documents are provided as for nationally funded projects.
2. Other direct cost calculations		
a. Equipment (depreciation: amounts and time, etc.)	Equipment is reimbursed at full cost.	Equipment is reimbursed based on depreciation.
b. Infrastructure (recorded as a direct cost, depreciation, etc.)	Infrastructure is reimbursed as a direct cost.	No adjustment necessary.
c. Other Direct Costs	Other Direct Costs are calculated on the basis of actual costs.	No adjustment necessary.
3. Indirect cost calculations		
a. Description of the calculation of indirect costs including cost drivers	Indirect costs are paid as a percentage of Total Modified Direct Costs (TMDC): 30% (25% for desk-based research) of Total Direct Costs less equipment and subcontracting.	Horizon 2020 indirect costs are calculated based on a similar procedure: 25% of the direct costs less subcontracting.
4. Internal invoicing		
a. Description of internal invoicing procedures	All internal invoices need to be justified to show that prices are built up from costs not imputed and do not include a margin.	Irish national funding agencies apply the same rules as the EU for internal charges.

Auditing and Control	Description of National Funders' Auditing Practices	Similarities and Inconsistencies Between EU and National Auditing Practices
1. Description of procedures, audit types, reporting deadlines, etc.	National funders such as Science Foundation Ireland (SFI) and the Health Research Board (SFI/HRB) have implemented substantial changes to their auditing procedures. Over the past four years, their approach has changed from annual transaction-based audits to a single control-based audit every two years. SFI auditors test the controls in place using a limited number of walk-throughs and then rate each control's design and operational effectiveness as high, medium or low. The institution is given a rating by the auditor across all controls instead of for individual research projects. Future audits then only focus on controls that obtain a low score for operational or design effectiveness. Audit time has dropped significantly as a result. This approach has also meant that HEIs can provide other funders with a report that ranks its control environment.	Horizon 2020 auditing and control procedures are transaction-based and differ significantly from the control-based audits performed by national funders. Irish universities also report issues with auditors engaged by the Commission to carry out audits on its behalf. Control has often been of mixed quality and auditors were not fully familiar with the Model Grant Agreement (MGA).

NORWAY

The development of the Norwegian TDI cost accounting model

The TDI full costing methodology for research[3] is a common national model designed to ensure that the full costs of all externally funded research project activities are identified. The model is based on the notion that **T**ime spent by academic staff is the primary driver of both **D**irect and **I**ndirect costs (TDI). It was developed by the university and college sector for uses including Norwegian Research Council (RCN) grant applications. Since 2015, the TDI model has been mandatory for all higher education institutions engaged in externally funded research.

The TDI model provides a method for presenting the full research activity costs incurred by an institution, including for projects funded by the Norwegian Research Council. Using this model helps promote:

- More accurate financing of actual research project costs
- Better resource management
- Improved Norwegian Research Council knowledge of the resources used in research projects
- Simplified and improved project finance monitoring

In 2011, RCN was involved in developing the principles for the TDI model. The model was then developed by two expert committees, first to analyse the details full costing, and then proposing how to solve the challenges of including infrastructure costs. This model is now known as the Norwegian Research Infrastructure Resource model (RIR model), and forms part of the TDI model.

The TDI model has been designed to be as simple as possible within the legal and financial frameworks, and to avoid detailed time recording and other administrative burdens for researchers.

Costs

University costs are divided in two categories: core activities and support activities. The first category includes academic staff salaries and allowances (e.g. travel expenses). These are always direct costs.

Some support activity costs traditionally seen as indirect costs are defined as direct costs in the TDI model. Support activity costs are now divided as follows:

a) Direct costs: major infrastructure investments and operating costs, instruments, laboratories, buildings and technical staff costs. These are known as Research Infrastructure Resources (RIR).

b) Indirect costs: costs related to general office and support space expenses, and horizontal services such as administrative and financial management, documentation, human resources, IT, legal advice, libraries, training and more. These costs are calculated as an average per FTE per institution and therefore do not vary between academic disciplines.

3 Norwegian Association of Higher Education Institutions (2014), The Norwegian Universities' Methodology on Full Costing, Oslo.

The RIR pricing model, which is a crucial part of the TDI model, provides a transparent and simple method for declaring the costs of using research infrastructure based on the full costs generated by the activity (Direct Measurement). Classifying the use of research infrastructure as a direct cost leads to more accurate resource allocation at project level, and ensures sustainable funding, especially regarding future investments in scientific equipment and infrastructure.

Figure 3. The Norwegian full costing model

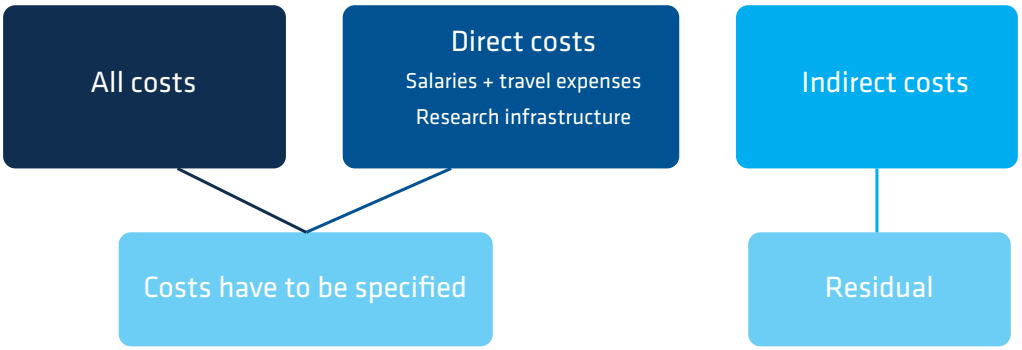
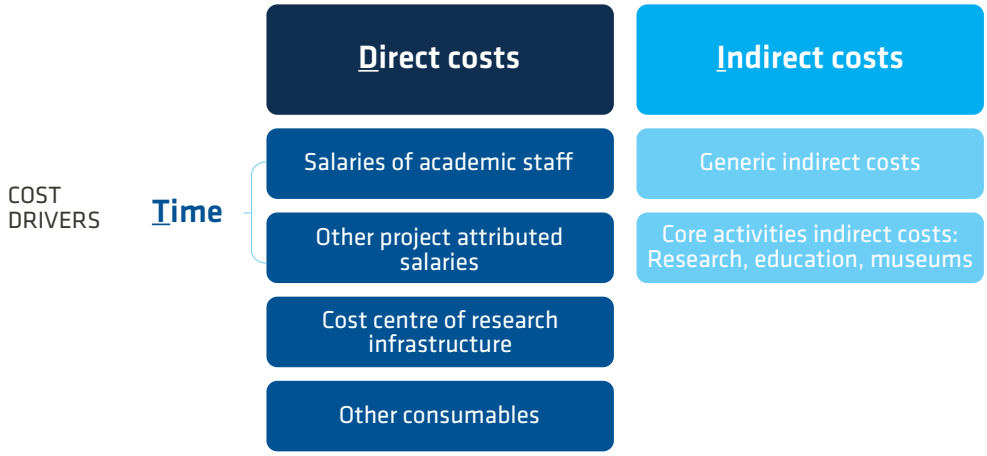


Figure 4. Overview of the TDI model



Research Infrastructure Resources model

The implementation of the Research Infrastructure Resources (RIR) model requires institutions to divide their research infrastructure into a number of clearly defined entities (RIRs). The scope of each RIR must be clearly defined, and the number of RIRs must be kept as low as possible to minimise the need for administrative support. The RIR model results in a price (cost per hour/day/week/unit). This price is the result of dividing the full costs of each RIR by its capacity.

RIR costs comprise four elements:

1. Space – building and rental costs for research spaces like laboratories and workshops
2. Scientific equipment – depreciation costs
3. Common operating consumables and service/maintenance contracts, i.e. costs shared by all users
4. Technical support – salary costs for the technical support staff needed to sustain infrastructure operations

RIR capacity equals the total number of user hours an RIR is designed to be able to provide under normal operating conditions. Capacity is calculated considering limiting factors like service and maintenance time and opening hours. Actual RIR use may stray from planned use, but below par exploitation due to poor efficiency cannot be used to set a higher RIR price.

The RIR model is flexible and can be adapted to various types of research infrastructure.

Acceptance of the model by national funders

The Ministry of Education and Research stipulated that all higher education institutions must implement the TDI model when submitting Norwegian Research Council (RCN) grant applications.

RCN can cover the lump-sum rate for fellowship-holders to reimburse academic payroll costs. RCN also funds the full operational cost of research infrastructure calculated using the RIR model.

RCN provides basic funding for certain costly research infrastructures (covering the cost of unused capacity for a minimum of 4 years).

Any gap between RCN funding and budgeted payroll costs must be defined as own funding.

Higher education partners in other countries' payroll and indirect expenses can be calculated using the respective institutions' own models, or the employer's salary costs (including social security charges), through an additional 25% flat rate for indirect costs.

Accounting practices accepted by national research programme funders

Calculation of the Different Cost Items to be Reimbursed	Description of the Accounting Practice Used	Can Nationally-accepted Practices be used for EU Funded Projects
1. Staff cost calculations		
a. Description of eligible staff cost elements and calculation methods (salary components, sick leave, holidays, pension, etc.)	The following elements are added to basic salaries in Norway: • 12% holiday accrual (14.30% when over 60 years old) • 11.5% employer's pension contribution (may vary – externally determined) • 14.1% employer's social security contribution • NOK 105.83 per month mandatory life insurance costs	All of the salary components accepted by national funders are eligible for reimbursement under EU funded projects.
b. Use of unit costs or other options to reimburse staff costs	N/A	N/A
c. Staff cost calculation period (actual, past year, etc.)	Internal hourly rates are calculated based on an estimation of the actual cost per annum or actual costs.	Hourly rates are calculated on the basis of the previous financial year.
d. Description of how staff time is accounted for/recorded (timesheets, profiles, fixed time, contract, etc.)	Scientific staff time is allocated based on a) general or individual agreements on time spent on core activities and b) agreements on time spent on specific, externally funded projects. The model assumes that academic employees with a research and teaching obligation (the Norwegian University norm is a 50/50 split) fulfil their obligations. Extra specification on time spent is only required when they work on externally financed projects. Time spent on a project is then specified as share of annual working hours. A full time equivalent (FTE) employee works 1628 hours after weekends, vacation, holidays and average sick leave rate are subtracted. Of the 1628 hours, 6% is spent on administration (98 hours), while the remaining 1530 hours are split between research and education in line with local guidelines (at group or individual level). The calculation of actual work as a share of FTE gives the number of hours and so no timesheets are necessary. For internal accounting purposes, when employees submit timesheets, staff costs are calculated on the basis of their yearly salary categories. For projects that do not require timesheets, costs are charged using the formula reported in point 1.a.	Timesheets are required for EU projects (except for staff working exclusively on a single EU project). There is therefore a deviation between the cost charged to the project for internal accounting purposes, and the amount reported to the EU. Timesheets are submitted electronically and approved by the project leader. Being able to use the TDI model for EU funded projects would make timesheets unnecessary. Time spent on EU projects could then be specified as a share of annual hours.

e. Statements and documents to justify staff costs	The agreement on time spent on each project by each individual is the basis for calculating project labour costs. The necessary documentation, signed by project management, is provided on a monthly basis. This documentation also specifies how any exceptions from the agreement have been handled.	Refer to point 1.d.
2. Other direct cost calculations		
a. Equipment (depreciation: amounts and time, etc.)	Equipment costs are calculated using the depreciation method. Scientific equipment depreciation time can be 4, 8 or 12 years. Depreciation is included in the RIR cost (refer to point 2.b.).	N/A
b. Infrastructure (recorded as a direct cost, depreciation, etc.)	RIR costs comprise four elements: 1. Space – building and rental costs for research spaces such as laboratories and workshops 2. Scientific equipment – depreciation costs 3. Common operating consumables and service/maintenance contracts, i.e. shared costs for all users 4. Technical support – salary costs for the technical support staff needed to sustain infrastructure operations RIR capacity equals the total number of user hours an RIR is designed to be able to provide under normal operating conditions. Capacity is calculated considering limiting factors like service and maintenance time and opening hours. Actual RIR use may stray from planned use, but below par exploitation due to poor efficiency cannot be used to set a higher RIR price.	Some adjustments are required under current Horizon 2020 rules. Some cost types are included in RIR costs but must be calculated as indirect costs for EU funded projects (e.g. space and indirect costs for technical support). Necessary adjustments identified concern the following costs: • Space (housing) costs • Indirect staff costs (technical support)
c. Other Direct Costs	Travel expenses = actual cost + any social expenses subject to taxation.	EU funders accept the Other Direct Costs calculation.
3. Indirect cost calculations		
a. Description of the calculation of indirect costs including cost drivers	Indirect costs include costs for horizontal services and support activities unrelated to research infrastructure. These include central university services (administration, IT, library) and support within the research unit (consumables, office, management and more). Some other support activity costs are generic and relate to human resources/financial management, IT/telephone and office costs. The same rate/amount is allocated to cover these costs for all relevant personnel. Remaining indirect costs for support activities are related to the core teaching and research activities and are calculated based on use.	The average rate of indirect costs for scientific staff is estimated at 60-65% of direct staff costs (varying from 30% for those on very high salaries to 105% for those with the lowest salaries). As the EU also accepts indirect costs under other costs, the 25% flat rate covers approximately 50% of the actual indirect scientific staff costs calculated using the Norwegian method.

4. Internal invoicing		
a. Description of internal invoicing procedures	Internal invoicing procedures can vary between institutions.	Under the Norwegian RIR model, internally invoiced costs are considered eligible (with the adjustments described in 2.b.) on the basis of MGA v.4.0 (and later).
Auditing and Control	**Description of National Funders' Auditing Practices**	**Similarities and Inconsistencies Between EU and National Auditing Practices**
a. Description of internal invoicing procedures	In Norway, all public HEIs are audited by the Office of the Auditor General. Most institutions additionally have internal audit offices.	EU audits place a heavy workload on institutions, especially when they are performed through private auditing companies. This is often seen as unnecessary bureaucratic work that duplicates existing national audits. Performing EU audits as an integrated part of the national auditing programme would save time and uncertainty.

SWEDEN

The development of the Swedish SUHF accounting model

Swedish universities have developed their accounting practices on the basis of a full costing model. The SUHF model (where SUHF stands for Association of Swedish Higher Education Institutions) has been used at all Swedish universities and university colleges since the 1st of January 2011.

Its introduction was coordinated at national level and developed in cooperation by university management, financial officers and representatives from important research funders. The most important drivers for change came from inside the institutions, as full costing was needed as a strategic management tool, as well as for decision-making and improved internal control. There was also a need to improve accounting principles and achieve long-term financial sustainability. An important external factor was the need to be able to provide accurate and transparent information about indirect costs, to restore the confidence of funding organisations and allow them to understand these costs. Reimbursement rules in the first years of FP7 also played an important role.

The SUHF model is based on budgeted rather than actual costs. Corrections for cost deviations must be made retrospectively to reflect actual costs. Each institution uses different time allocation methods, but these are generally based on management estimations, rather than time records.

National public and private funders supported the adoption of the model. Although the government did not provide any financial support for its development, governmental research funding bodies accepted the method and adopted new financing principles. The Swedish Research Council and the Wallenberg Foundation (one of the largest private research funding organisations in Sweden) fully accept institutional accounting practices for actual staff costs allocated according to the time commitments to research projects.

No formal agreement to certify the SUHF model for indirect cost calculation was reached under FP7. Stakeholders from different universities discussed the SUHF model with the EU audit office. The auditors pointed out SUHF model shortcomings with regard to the calculation of indirect costs on the basis of budgeted rather than actual costs. The teaching and research split was also deemed as not auditable.

Accounting practices accepted by national research programme funders

The information included in the following table describes accounting practices at Lund University and the University of Stockholm.

<table>
<tr><th>Calculation of the Different Cost Items to be Reimbursed</th><th>Description of the Accounting Practice Used</th><th>Can Nationally-accepted Practices be used for EU Funded Projects</th></tr>
<tr><td colspan="3">1. Staff cost calculations</td></tr>
<tr><td>a. Description of eligible staff cost elements and calculation methods (salary components, sick leave, holidays, pension, etc.)</td><td>Employees receive the monthly salary defined in their contract. Staff costs can be divided into the following categories:
<table><tr><th>Cost Element</th><th>Calculation Method</th></tr><tr><td>Individual salary</td><td>Actual cost</td></tr><tr><td>Employer contributions</td><td>Actual cost</td></tr><tr><td>Sick leave</td><td>Actual cost</td></tr><tr><td>Holiday</td><td>Actual cost</td></tr><tr><td>Payroll tax</td><td>Actual cost and flat rate</td></tr><tr><td>Pension</td><td>Actual cost and flat rate</td></tr><tr><td>Occupational health care</td><td>Flat rate</td></tr><tr><td>Wellness contribution</td><td>Actual cost, annual payment</td></tr></table></td><td>The various staff cost elements are usually eligible for EU project reimbursement, with some exceptions. The flat rate used to calculate some pension fees has caused problems during audits. The use of flat rates is a standard accounting procedure for all government agencies that receive invoices from the National Government Employee Pensions Board (SPV).

Auditors have not always accepted the cost of occupational healthcare provision, despite the fact that employers are obliged to provide this by the Work Environment Act. The wellness contribution has also caused problems on some projects as auditors and/or programme officers have not always deemed it eligible. Under nationally funded projects, each employee can claim wellness contributions (up to a certain limit set by the organisation) when they provide receipts to justify the cost incurred.</td></tr>
<tr><td>b. Use of unit costs or other options to reimburse staff costs</td><td></td><td></td></tr>
<tr><td>c. Staff cost calculation period (actual, past year, etc.)</td><td>Salaries are recorded monthly in the HR system.

The Swedish funding agency allows universities to report the salary recorded for a project in their accounting system without any obligation to create and/or provide further documentation.</td><td>For EU funded projects, staff costs can be calculated using two different methods.

The first option involves calculating salaries on the basis of each closed financial year. This option requires adjustments from the national model because: (a) salaries increase yearly and the change can create discrepancies between the information included in the project financial statement and the internal project accounting system and (b) the institutional system was not designed to</td></tr>
</table>

		calculate salaries on an annual basis, and so further calculations using external tools are necessary. In general, the main problem of basing salary costs on the previous financial year is that the resulting eligible costs do not match the salary costs in the project accounts. The second option involves calculating salaries on a monthly basis. This option requires considerable administrative work as monthly salaries usually fluctuate due to holiday payments and salary increases.
d. Description of how staff time is accounted for/recorded (timesheets, profiles, fixed time, contract, etc.)	A researcher is expected to work 1700 hours/year. Swedish funding agencies do not require justifications of the amount of time staff work on a given project. Local union agreements on teachers' and researchers' working hours can differ between universities.	EU funded project time accounting/allocation requires the creation of timesheets and the calculation of an hourly rate that divides annual staff costs by 1720 productive hours/year. This calculation is not used for any other project at the university. The actual salary costs calculated using the internal accounting system cannot be reported to the EU. Eligible salary costs must be calculated based on hourly salary costs and timesheets. Timesheets are not used to record time for other projects.
e. Statements and documents to justify staff costs	National funders require Swedish universities to submit a cost statement showing internal salary calculations. They accept this cost statement as proof of staff costs.	Timesheets are only used for EU projects and in some cases, EU auditors rejected Excel files as a reliable time recording system.
2. Other direct cost calculations		
a. Equipment (depreciation: amounts and time, etc.)	The Swedish National Financial Management Authority (ESV) provides guidelines on equipment cost reimbursements. For instance, an item can be considered equipment if it costs more than 25,000 SEK and has a life expectancy of at least 3 years. Depreciation is calculated monthly. Internal institutional guidelines set depreciation rules and the depreciation periods for different types of equipment.	
b. Infrastructure (recorded as a direct cost, depreciation, etc.)	Nationally funded projects record infrastructure costs under different accounting categories: depreciation, energy, maintenance, salaries, water.	EU funded projects require infrastructure unit costs to be calculated on the basis of the actual costs from the 2 previous years and actual use for the project. National funders do not request or use unit cost calculations.
c. Other Direct Costs	Other Direct Costs are reimbursed on the basis of the actual costs incurred (except subsistence costs for which flat rates set by the Swedish Tax Authority apply).	In principle, no adjustments are required to submit a claim for Other Direct Costs. However, deducting the VAT from researcher travel bills is particularly demanding from an administrative point of view.

3. Indirect cost calculations		
a. Description of the calculation of indirect costs including cost drivers	Indirect costs are calculated according to the SUHF model and based on: a) Direct salaries b) Direct salaries and running costs The indirect costs calculated using the SUHF model vary considerably between universities and between departments within a single university.	The methods used to calculate indirect costs can vary significantly between universities. It is therefore extremely difficult to assess whether the 25% of direct costs flat rate used by EU funders is sufficient to cover the actual indirect costs incurred. SUHF collects and compiles annual university statistics. In 2016, the total average percentage of indirect costs on total direct research costs was 19.6%.
4. Indirect invoicing		
a. Description of internal invoicing procedures	Internal invoicing for salaries is calculated by adding social security expenses and SUHF indirect costs to the monthly salary. The annual budget calculation for the use of laboratories is then invoiced to users. These costs are usually based on historical data and therefore not actual. Internal invoices for goods and services do not include indirect costs.	Horizon 2020 requires substantial administrative work to calculate unit costs based on actual eligible costs for the use internal invoices. Internally invoiced costs are often subsidised for internal users and are not calculated yearly. The question of how internal invoices will be audited also creates uncertainty.
Auditing and Control	**Description of National Funders' Auditing Practices**	**Similarities and Inconsistencies Between EU and National Auditing Practices**
1. Description of procedures, audit types, reporting deadlines, etc.	The Swedish National Auditing Office usually audits universities annually. Their audits focus more on processes, policies, internal management and control than specific project accounting.	On previous occasions, EU auditors have required the following documentation: • Timesheets • Proof of what each employee worked on each month • Physical invoices (even though all Swedish institutions use e-invoices) • Bank documents to prove that a specific cost has been paid, which is hard as a single institute makes several thousand transactions a week • Proof that social security contributions were paid for a specific employee. This procedure is problematic because of the high number of employees. Monthly transactions show the amount for the whole institute, not a specific person. Proofs of payment are not required by any national funding agency. It is therefore very challenging to extract this documentation from the SUHF system.

UNITED KINGDOM

The development of the TRAC accounting methodology

The TRAC (Transparent Approach to Costing) methodology has been implemented at all UK universities since 2000. This model is used to report universities' income and expenditure under teaching, research and other activities.

Research in the UK is primarily focused within universities, and has long been heavily dependent on competitive, grant-based funding. The system operates under the principle of 'dual support', whereby universities receive core funding from the national funding council, designed to cover the cost of the research infrastructure needed to support competitively funded research projects. The TRAC methodology was developed in the face of underinvestment in core funding, which failed to keep pace with the significant growth of research activities in the 1980s and 1990s. The UK government therefore provided additional funding for university infrastructure on condition that universities became more transparent about the way funds were spent.

TRAC was developed as an activity-based costing methodology. It uses academic staff time allocation surveys (not timesheets) as cost drivers to allocate all expenditure to relevant activities. TRAC also includes proxy cost adjustments designed to allow for the fact that universities' 'real' costs are higher than the historic expenditure set out in their accounts, due to a combination of: understatement of current asset values by some institutions; inadequate investment in physical assets (seen, for example, in maintenance backlogs) and in student services and support; and the need to allow a surplus or margin for risk, financing and development.

TRAC revealed universities' continuing failure to cover the full costs of their research: income from competitive research funding plus core funds was significantly less (by over 1.2 billion euros a year) than the real costs of the research undertaken. Encouraged largely by funders and national quality assessment exercises, universities had developed a 'low-cost culture' under which the volume of research activity and its outputs were far more important than cost recovery.

Following a 2003 consultation on the sustainability of research, the UK Government introduced a requirement that universities should 'recover, in aggregate, the full economic costs of all their activities'. This resulted in the development of a national methodology to establish the full economic costs (FEC) of research at project level in 2005. Universities themselves managed the initiative, and the FEC methodology was funded by the government and developed by a pilot group of nine universities with different profiles, working in close collaboration with the national funding councils.

Under FEC, universities use their TRAC data to calculate their property and indirect costs. They then identify all of the direct and indirect research costs at project level, regardless of whether the research sponsor will cover all of these costs.

The government accepted that funding levels needed to increase to sustain volumes and allocated additional funds to research councils to allow them to cover 80% of the full economic cost of all of the research they funded. The intention was to eliminate cross-subsidies from research to teaching, and to ensure appropriate infrastructure funding. In return, universities were expected to demonstrate that research activities were sustainable.

While FEC originally focused on research, a 2005/2006 funding council review extended the use of TRAC to provide cost data to inform teaching funding. This led to the 2007 introduction of a national framework for costing teaching, based on TRAC methodology principles – TRAC(T), in order to provide information about the full economic cost of teaching in different disciplines.

The TRAC model also underwent the process of certification under the EU 7th Framework Programme (FP7). The TRAC EC-FP7 process aimed to adapt the UK TRAC model to FP7 requirements but was ultimately not used by institutions

as they found it too complex. Box 2. Focus on Full Economic Cost (FEC) in the United Kingdom and European Project Costs details the adaptations made to satisfy European Commission requirements on staff and indirect cost calculation methods. It was not made compulsory under FEC as considerable administrative work was needed to comply with these requirements.

The TRAC and FEC process was long, used significant resources and required major university culture changes. The fact that it was coordinated at national level by universities themselves with full government support (financially and technically), helped immensely. The key issue here was and is the tension between academic incentives to win funding for research and publication, and the pressures on universities to cover the real costs of all their activities in whatever way they can.

TRAC and FEC can be said to have been a success in that they led to a cultural shift at UK universities with regard to understanding the resource implications of any project. Overall, cost recovery has also improved. While TRAC is primarily concerned with cost analysis, some universities use the resulting data to inform their internal resource allocation models.

Acceptance of the model by national funders

The model is fully accepted by large private funders of competitive research programmes, such as the Wellcome Trust and the Kennedy Trust for Rheumatology Research. The latter has used the methodology since 2005 to encourage beneficiaries' financial sustainability. In order to avoid duplication and administrative burden, private funders also rely on robust national audit procedures, such as the HEFCE Assurance and Accountability and the UK Research Council's Funding Assurance Programme. Under current provisions, funders and charities benefit as a result of the agreement with the government because the government funds indirect costs, and beneficiaries gain sustainability, a clear knowledge of the costs of their work and audit assurance.

Box 2. Focus on Full Economic Cost (FEC) in the United Kingdom and European Project Costs[4]

In 2005/06, Universities UK (UUK) co-ordinated a project to analyse FP6 project costs on a FEC basis, to gain a better understanding of the potential effects of introducing FEC on institutional engagement with the programme. The project illustrated and quantified the funding gap based on use of the additional cost model, and highlighted the issues and academic benefits of engagement. In 2007 and 2008 UUK co-ordinated a further exercise to determine how TRAC methodology would need to be modified to meet the requirements of FP7. This required a comparative review of the methodology against FP7 requirements. Significantly, the UK methodology met the requirements, although a number of areas were identified for adjustment or detailed work. In particular, TRAC EC-FP7 required five changes to TRAC-FEC processes:

i) Exclusion of ineligible costs from the indirect cost category

ii) The completion of project timesheets by academic staff who spend a proportion of their total working time on FP7 projects

iii) Reflection of the actual time spent and salary of academics working on FP7 projects

iv) Reflection of actual indirect cost rates and actual time on FP7 projects

v) Additional quality assurance

The ineligible costs that needed to be removed from the indirect cost category were: cost adjustments (the net infrastructure charge, and gross returns on financing and investment), irrecoverable VAT, VAT on overseas expenditures, exchange rate gains or losses, any provisions, and the finance elements of any lease costs. In addition, depreciation had to be included on a historic cost basis rather than on a current cost revaluation basis. These changes were all achievable, although irrecoverable VAT could have been handled using the partial exemption methods currently applied by UK institutions.

Requiring FP7 project staff to complete full monthly timesheets (showing total productive hours and hours charged to EC FP7 projects) is technically achievable, but will affect staff, as this level of recording was not required at the time.

Timesheet data could have been used to charge staff time to projects, instead of using the time estimates defined at the application or award stage, which is the approach used under the standard FEC methodology. The change could lead to additional processes at most institutions.

4 *EUA (2008), Financially sustainable universities. Towards full costing in European universities.*

Similarly, under standard FEC methodology, indirect costs are charged on an estimated basis (using historic costs), whereas the EC-FP7 variation requires actual cost calculation (charging after the period ends), except where actual costs are not yet available (for example, for the final claim), when an estimate is permitted. This will also require adjustment to institutional operational processes.

In terms of additional quality assurance, the UK's Quality Assurance and Validation process could have been extended to include a specific review of an institution's implementation of the EC-FP7 methodology, in order to provide the necessary assurance.

Box 3. Design and implementation of TRAC methodology at the University of Birmingham

University of Birmingham: Founded in 1900, 26800 students, 6000 staff, comprehensive university.

The process for collecting time use data at the University of Birmingham was originally developed around the year 2000 and has since undergone several refinements. The university was one of the original nine pilot universities that worked on developing the Transparent Approach to Costing (TRAC) methodology and has been directly involved in every major development since. The time allocation process therefore evolved in tandem with the rollout of TRAC across the sector.

A number of key decisions needed to be made at the outset:

- Who should be asked to participate (which staff types)?
- What are they required to do?
- How often should the data be collected?
- How can we ensure that the process produces statistically accurate results?
- How should the information be collected?

In the first round of time allocation surveys, heads of school were provided with a spreadsheet listing all their academic staff and asked to allocate the proportion of time spent on a number of defined activities over the whole of the previous academic year.

A full, detailed, schedule explaining the precise definition of these activities was also provided. These definitions were developed in close cooperation with other universities in the UK and in accordance with TRAC. They covered 'direct' time spent on income-generating activities (teaching, research, other) as well as 'support' time (preparing lectures, writing research bids, etc). Some heads of school completed the spreadsheet themselves, others asked staff to complete them individually and then performed a quality check. Once completed, the time data was weighted by pay grade and averaged for each school to produce a time-based method for allocating academic staff costs. Heads of school were asked to sign off the summary level view as being representative of the balance of activities. All of the data was collected via spreadsheet completion.

The use of timesheets had been discussed earlier, as some academics wanted to report the hours worked, rather than a rough proportion of the time spent on different activities. However, it was felt that this level of detailed time recording was not required for full economic costing, and would cause more work than benefits for all involved.

The process has since undergone several refinements including the following key developments:

- Continuously providing staff with information about the purpose of collecting this data and a number of assurances helped convince employees of the usefulness of the procedure. The university clearly stated that this data would never be used at individual staff level (e.g. to monitor performance) and would only be used as aggregated data for costing purposes. This helped overcome union and staff representatives' scepticism.
- Annual retrospective surveys were replaced by tri-annual retrospective surveys, as the distribution of time between activities varied considerably between semester 1, semester 2 and the summer period.
- An online password-controlled submission system was developed using a website that also contained background and supporting information to help staff complete the exercise and facilitate data collection.
- The university decided to collect time data from individual academic staff rather than heads of school for greater accuracy. Heads of school tend to indicate time distribution in a way that reflects staff profiles and HR plans, rather than how it is actually used by individual staff. At first this had a negative impact on response rates, which went down to about 65%, as it was harder to chase individual staff (to be statically valid response rates should be at least around 70%). Nevertheless, the university considered this change necessary to strengthen process ownership by all academics in the long term.
- Furthermore, non-respondent chasing was devolved to local management at departmental level, which helped push response rates up to around 90%.

Part 2. Established institutional accounting practices accepted by national competitive research programme funders

BELGIUM, FLANDERS

The development of a cost accounting methodology at Flemish universities

In Belgium, the language communities are responsible for education and research policies. As a result, universities operate under two different and independent legal frameworks, whose funding mechanisms are regulated by the Flemish and French-speaking communities. Although both communities have discussed a full costing methodology, it has been developed differently in each. The Flemish system is presented in detail below.

Flemish-speaking community

Discussions about implementing a common costing methodology at Flemish universities started in 2007, driven by the FP7 reimbursement rules. The ability to demonstrate the real costs of university activities to public funders was an additional incentive.

The Flemish Interuniversity Council (VLIR), which represents the six Flemish universities, committed to support the implementation process from 2011 to 2013. Preparations began at most universities in 2010, when the necessary human resources were allocated to the project. University finance departments coordinated the process, sometimes in collaboration with research departments. University management and academics were included in the project steering groups.

Universities achieved different stages of development: some institutions put a system in place, other universities decided not to proceed with effective implementation, despite the fact that full costing helped them gain a better understanding of the real costs of their activities. At some Flemish universities, full costing projects have been incorporated into strategic plans and the university board is informed through quarterly reports.

Flemish universities had to overcome common obstacles, such as resistance from members of the academic community concerned about time allocation mechanisms, and limited implementation resources. However, the Flemish Interuniversity Council supported the process and encouraged universities to share their experiences and exchange good practices.

Regional (VLAIO, FWO) and federal (FOD) competitive research funders rely on institutional accounting practices to reimburse the direct costs incurred in research projects. As for EU funded projects, direct costs are claimed on the basis of actual costs while a flat rate covers indirect costs. National funders accept institutions' calculation of the actual staff costs as recorded in the accounts and do not require timesheets (except for state personnel).

Institutional accounting practices accepted by national research programme funders

The information reported in the following table refers to the accounting practices applied at Ghent University.

Calculation of the Different Cost Items to be Reimbursed	Description of the Accounting Practice Used	Can Nationally-accepted Practices be used for EU Funded Projects
1. Staff cost calculations		
a. Description of eligible staff cost elements and calculation methods (salary components, sick leave, holidays, pension, etc.)	Most funding agencies accept the salary costs as they are calculated in the institutional accounting system, without further calculations or timesheets. No salary components are excluded. They include holiday and end of year pay provisions, insurance and commuting costs.	It is difficult to use institutional practices to calculate staff costs for EU funded projects because of the provisional components included in salaries (e.g. holiday pay). EU audits require proof of actual payment for these items, which creates a high administrative burden.
b. Use of unit costs or other options to reimburse staff costs	N/A	N/A
c. Staff cost calculation period (actual, past year, etc.)	Staff costs are calculated according to the actual period of the claim.	
d. Description of how staff time is accounted for/recorded (timesheets, profiles, fixed time, contract, etc.)	Timesheets are not required. If a staff member assigns 50% of their time to a FWO project, the university assumes they spent 50% of their time on the project. Timesheets are only required if a percentage of a statutory staff member's salary is claimed.	
e. Statements and documents to justify staff costs	Most funding agencies accept an extract from the institutional accounting system (loonstaat).	The same extract from the institutional accounting system can also be used for Horizon 2020 projects. No adjustments necessary.
2. Other direct cost calculations		
a. Equipment (depreciation: amounts and time, etc.)	Some national/regional funding agencies accept the total equipment cost, without depreciation, for some projects.	
b. Infrastructure (recorded as a direct cost, depreciation, etc.)	Specific infrastructure projects are designed to fund infrastructure purchase, maintenance and repair, therefore no depreciation is calculated.	EU funded projects require infrastructure unit costs to be calculated on the basis of the actual costs from the 2 previous years and actual use for the project. National funders do not request or use unit cost calculations.
c. Other Direct Costs		No adjustments necessary.

3. Indirect cost calculations		
a. Description of the calculation of indirect costs including cost drivers	The university calculates a maximum flat rate of 17% of incoming funds (less if more than 17% is paid by the funding agency) to cover the reimbursement of indirect costs. In several cases, national and regional funding agencies pay 20,000 euros indirect costs per person per year. As a result only indirect staff costs are reimbursed.	There is currently no calculation based on a full costing model available for calculating the university's indirect costs, therefore it is not clear whether the Horizon 2020 25% flat rate is sufficient to cover the costs.
4. Indirect invoicing		
a. Description of internal invoicing procedures	National and regional funding agencies have no specific internal invoicing rules.	Although Framework Programme beneficiaries can use their own accounting principles for the reimbursement of 'unit costs for internally invoiced goods', Belgian institutions find it difficult to apply this procedure. Some of the elements of the university's usual unit cost calculation methodology conflict with the EU's list of ineligible costs, so universities have to exclude all of the elements ineligible under the Grant Agreement. This process is time consuming and risks including indirect/ineligible costs in the financial reporting. Ghent University is currently looking at ways to set up a centralized system for managing and invoicing shared services, but it is impossible to comply with all of the rules set by different funders. Given the specificity of EU rules, a specific unit cost definition for EU projects will be necessary.
5. Other relevant elements for cost reimbursements		
	Flemish universities are subject to a mixed VAT regime and work with a provisional rate (based on the previous financial year) to determine the deductible amount. As the deduction ratio is only determined at the end of a fiscal year, universities have to use the rate from the previous financial year. This requires adjusting the difference between the provisional and the final ratio in the next reporting period, which creates a lot of administrative work for a marginal difference in total funding. The procedure is therefore not applied at Ghent University. In some cases, institutions do not recover foreign VAT as it is too time-consuming. Only deductible VAT is therefore claimed as a cost and reimbursed.	Ghent University reports specific issues experienced with VAT reimbursement under Horizon 2020 projects. Although 'recoverable and identifiable' VAT is a cost. However, the university does not claim this cost because of the high administrative workload involved.

Auditing and Control	Description of National Funders' Auditing Practices	Similarities and Inconsistencies Between EU and National Auditing Practices
1. Description of procedures, audit types, reporting deadlines, etc.	The Research Foundation – Flanders (FWO) performs audits at the end of projects that receive over 450,000 euros funding. They also perform random audits every year, on a maximum of 30% of the institutions' projects. Audits are performed by FWO internal auditors. Host institutions submit an audit report on the previous financial year's accounts to the FWO before 30th April each year. Before 15th March, each host institution submits a certificate from its own independent auditor covering the previous financial year to the FWO, stating that, excluding any awarded and charged 6% overhead, the expenditure reported in the financial reports, matches the host institution's accounts. The host institution has a right to reply and can grant the FWO independent auditor access to the records of its independent auditor. These procedures are designed to avoid double audits.	Some EU controls could be covered by institutions' audited annual accounts. However, some checks need to be linked to very specific EC regulations that are never audited by any other funding agency or auditor (e.g. staff cost calculations). Therefore, broader cross-reliance on audits cannot be achieved when the rules are so specific.

FRANCE

The development of a cost accounting model at French universities

National funding bodies were largely responsible for promoting the development of a common university costing methodology in France. The issue was placed in the context of universities' financial sustainability, institutional management and steering. The Ministry of Higher Education and Research also regards full costing as a tool that provides long-term forecasting information based on a better understanding of costs. The Ministry is currently promoting a unified cost accounting methodology across the country.

In 2005, the development of full costing was initiated by the AMUE (*Agence de Mutualisation des Universités et Établissements*), CPU (the conference of French university rectors) and a group of university representatives, including presidents, accountants and financial officers. In 2006 and 2007, the launch was followed by a pilot phase. Although AMUE proposed a methodology, tools, techniques and joint training, each university developed its own approach for its specific context. The specific 7th Framework Programme (FP7) cost reimbursement methods shaped the development and implementation of the methodology at some institutions. Projects were usually initiated by university leadership, implemented by financial officers and managers, and frequently overseen by the vice-president of financial affairs. In the late 2000s, fewer than 20 universities had reached an advanced stage of implementation. In January 2011, the EUIMA-Full Costing workshop gave added momentum to implementation plans.

In 2013, the Ministry for Higher Education, Research and Innovation coordinated the development of common guidelines for university costing methodologies. The need for greater transparency in calculating the cost of educating students drove this renewed process. The Directorate-General for Higher Education set up working groups with the National Rectors' Conference and the Conference of Deans of French Schools of Engineering, along with other Ministry units. In 2014, these groups defined a common structure (types of activities, disciplinary groups) and common methodological guidelines on how to measure costs. These aimed to explain the objectives, major guiding principles and methodological choices made by the working groups. However, it was not a procedure describing how to implement the full costing methodology, which remains specific to each institution.[5]

A monitoring committee bringing together the various stakeholders representing the diversity of the university community issued opinions and recommendations on the outcomes of the working groups. A steering committee, an institutional decision-making body associating the main decision-makers from the Ministry of Higher Education and Research (Cabinet, DGESIP, DGRI, DAF, Conference of University Rectors and Conference of Deans of French Engineering Schools (CDEFI)) validated the project.

In 2015-2016, a group of institutions successfully tested the methodology, leading to discussions between the Ministry and the sector about its further implementation. This momentum also built on an increased focus on the development of university lifelong learning programmes, and the associated need to adequately cost and price such activities.

As delegated acts of French legislation reasserted the importance of analytical accounting at universities, the Ministry organised deployment on the basis of the five-year contract negotiations it holds with every institution. In 2017, 30 universities due to negotiate their contract in 2018-19 were included in the project. A series of workshops were held to help them adopt the methodology, along with direct monitoring and support from core project team members (university practitioners experienced in analytical accounting). The Ministry intends to repeat the process with the other university groups over the next five years.

5 Ministère de l'Éducation nationale, de l'enseignement supérieur et de la recherche (2015), Guide 2015 - comité de suivi du 20 mars 2015, Connaissance des coûts des activités des établissements d'enseignement supérieur et de recherche, Paris.

The goal is to generate and exploit comparable income and expenditure data, consolidated at national level, and that allows institutional benchmarking. In the absence of additional resources, the Ministry has adopted an approach of regulatory requirement combined with training and sector support.

Working groups with a greater focus on contractual research costs were set up to address the issue of flat rates for indirect research costs, as well as to develop a refined methodology to support the distance and blended learning business model.

Institutional accounting practices accepted by national research programme funders

The information included in the following table refers to the practices implemented at the University of La Rochelle.

Calculation of the Different Cost Items to be Reimbursed	Description of the Accounting Practice Used	Can Nationally-accepted Practices be used for EU Funded Projects
1. Staff cost calculations		
a. Description of eligible staff cost elements and calculation methods (salary components, sick leave, holidays, pension, etc.)	Statutory staff salaries are not eligible for funding from the French National Research Agency and the French Agency for the Environment. All contractual staff salary elements are reimbursed. These include employer's charges, sick leave, holidays, pension, etc. As a precautionary measure, bonuses and complementary teaching time are not included.	Statutory staff are eligible for partial funding under Horizon 2020, making the programme far more generous than the French National Funding Agency. As a precautionary measure, projects bonuses and complementary teaching time are not included in staff cost calculations, although some bonuses are eligible under Horizon 2020.
b. Use of unit costs or other options to reimburse staff costs	N/A	N/A
c. Staff cost calculation period (actual, past year, etc.)	Staff costs are calculated for the actual period of the claim.	
d. Description of how staff time is accounted for/recorded (timesheets, profiles, fixed time, contract, etc.)	As contractual staff work on the project full time, no timesheets are requested. The project name and acronym are specified in the employment contract.	As a precautionary measure, timesheets are also required from contractual staff working on Horizon 2020 project. It would ease project follow-up if this this could be avoided.
e. Statements and documents to justify staff costs	Researchers' employment contracts and agendas would be consulted in the case of any audits.	
2. Other direct cost calculations		
a. Equipment (depreciation: amounts and time, etc.)	Equipment purchase is eligible for French National Research Agency funding. Other Agencies (e.g. the Agency for the Environment) only allow depreciation calculations.	
b. Infrastructure (recorded as a direct cost, depreciation, etc.)		

c. Other Direct Costs		It is often difficult to justify Other Direct Costs given the variety of costs included in this category. The cost of justification is often disproportionate to the financial issues at stake as a result. Allowing beneficiaries to choose whether to declare Other Direct Costs as either actual costs or a flat rate could reduce reporting time for small partners.
3. Indirect cost calculations		
a. Description of the calculation of indirect costs including cost drivers	The French National Research Agency sets indirect costs at 8% of funding. The French Agency for the Environment sets indirect costs at 20% of the total costs (including permanent staff).	The University of La Rochelle's total indirect costs are 24%. The Horizon 2020 flat rate is therefore sufficient to cover the indirect costs incurred.
4. Internal invoicing		
a. Description of internal invoicing procedures	Internal invoices are issued on the basis of a pricing system established and validated by the University Board. Costs must be identified and traceable, but reporting is simplified, as funders do not require a detailed description of the items included in internal invoices.	Researchers need to use technical platforms made available within the university for EU projects. However, unit cost calculations do not meet commission requirements as they include indirect and ineligible costs. Therefore, although the commission allows internal invoice costs to be calculated according to internal accounting practices, universities generally choose not to claim them in case of subsequent rejection by the auditors.
Auditing and Control	**Description of National Funders' Auditing Practices**	**Similarities and Inconsistencies Between EU and National Auditing Practices**
1. Description of procedures, audit types, reporting deadlines, etc.	Universities can be audited on site. Standard audits are usually performed by the Ministry of Finance (rather than the funding agencies).	

GERMANY

The development of a cost accounting methodology at German universities

Germany's federal nature and the different legal frameworks and practices in the 16 federal states influenced the development of a harmonised cost accounting methodology at German universities and made it difficult to evaluate the degree of implementation. These developments were only occasionally coordinated at federal level through working groups and guidance on the implementation process. Additional resources were generally not available.

Full costing methodologies are mainly used to demonstrate the full costs of externally funded research and consequently obtain higher reimbursement, notably for indirect costs. This also contributes to an enhanced understanding and awareness of costs at German universities and to more effective use of funds. However, two major challenges were detected: time allocation and the fact that not all costs are included in university accounting systems (due to different rules and regulations on building ownership, building maintenance costs, depreciation and pensions).

University accounting has been significantly influenced by two major developments in Germany. The first attempt to introduce cost accounting was made by the heads of administration working group, which formulated a system of cost accounting rules in 1999. Most German universities approved these rules at a meeting held in the University of Greifswald in the same year, resulting in the Greifswald Resolution. These principles were subsequently accepted as a basis for good practice in university accounting by the German Institute of Chartered Accountants. They were also approved by the Standing Conference of Ministers of Education and Cultural Affairs. However, the federal finance ministers, who are responsible for the accounting systems used in their respective state, did not grant final approval, and the Greifswald Resolution was therefore not applied universally. Nevertheless, it significantly influenced university accounting in Germany.

The cost accounting framework developed by the Federal Ministry of Finance in cooperation with the 16 State Ministries of Finance also shaped accounting practice in German higher education institutions. On the basis of this framework, 16 different systems were developed. However, the framework primarily addressed public administration, not higher education needs. To make the situation even more complex, some states were already moving from cameralistic to double-entry bookkeeping.

FP7 and the Community Framework for State Aid for Research, Development and Innovation (RDI Framework) were major drivers in the debate on the implementation of full costing. Furthermore, many German universities' increasing engagement in external cooperations at national level led them to identify the need for appropriate costing methodologies.

Institutional accounting practices accepted by national research programme funders

The information reported in the following table refers to accounting practices at the Ludwig-Maximilians-Universität Munich (LMU Munich) and the Technische Universität Braunschweig (TU Braunschweig).

Calculation of the Different Cost Items to be Reimbursed	Description of the Accounting Practice Used	Can Nationally-accepted Practices be used for EU Funded Projects
1. Staff cost calculations		
a. Description of eligible staff cost elements and calculation methods (salary components, sick leave, holidays, pension, etc.)	All staff salary cost elements are reimbursed as accounted for by the institution.	Some elements are removed in order to calculate the hourly rate, as they are ineligible under EU rules (compensation for teaching activities, additional remuneration).
b. Use of unit costs or other options to reimburse staff costs	Reimbursement of costs actually incurred during the period, as recorded in the project accounts.	LMU has started to use unit costs for Horizon 2020 projects. However, this is not delivering simplification as the unit costs only apply to technical and scientific staff - not professors. This distinction is time consuming and creates uncertainty about cost recoverability. Moreover, the scheme requires the use of specific tools (timesheets, tools to calculate staff costs, training sessions, etc). An application for the certification of unit costs under Horizon 2020 (CoMUC) is underway and was prepared with KPMG. TU Braunschweig does not use unit costs for staff cost calculations and did not apply for CoMUC.
c. Staff cost calculation period (actual, past year, etc.)	Staff costs are calculated on the basis of the actual costs incurred during the reporting period.	The Horizon 2020 project calculation period is based on the previous financial year.
d. Description of how staff time is accounted for/recorded (timesheets, profiles, fixed time, contract, etc.)	German universities have no staff time recording system in place. No proof of time worked is needed for nationally funded projects. National funders such as the German Research Foundation (DFG) accept that universities charge the costs actually booked to the project, without requiring proof of actual hours worked (e.g. timesheets).	The EU policy of calculating working hours on the basis of timesheets is not common practice. As a result, researchers make mistakes and controls are needed at all levels. Furthermore, artificial solutions have to be created, for example, in the case of Principal Investigators involved in ERC funded projects. As German professors are not subject to any specific working time regulations, their work has to be aligned with other staff categories, irrespective of any applicable national legislation.
e. Statements and documents to justify staff costs	Project accounts.	Timesheets, pay slips, employment contracts, project accounts.

2. Other direct cost calculations		
a. Equipment (depreciation: amounts and time, etc.)	The table provided by the German Research Foundation (DFG) is used to calculate depreciation values.	Horizon 2020 projects accept LMU Munich and TU Braunschweig equipment cost accounting practices.
b. Infrastructure (recorded as a direct cost, depreciation, etc.)	Infrastructure costs are included in indirect cost calculations.	Infrastructure costs are covered by the indirect costs flat rate.
c. Other Direct Costs	Reimbursed according to national and regional regulations.	Horizon 2020 projects accept LMU Munich and TU Braunschweig accounting practices for travel expenses, consumables and other direct costs.
3. Indirect cost calculations		
a. Description of the calculation of indirect costs including cost drivers	Indirect costs are usually covered by a flat rate. LMU Munich estimates that its indirect costs are 20% - 45% of the direct costs, depending on the faculty. TU Braunschweig calculates that research or industry project indirect costs are 68% of the direct staff costs.	
4. Internal invoicing		
a. Description of internal invoicing procedures	LMU Munich usually calculates internally invoiced costs on the basis of lump sums (cost per unit or hour, etc). TU Braunschweig usually calculates costs on the basis of the material costs (e.g. consumables, material costs, equipment use).	LMU Munich requests proofs as part of its unit calculation method. TU Braunschweig records the actual cost in its accounts.
5. Other relevant elements for cost reimbusements		
		LMU Munich found it difficult to use the 'Third Party Resources' option under Marie Curie actions. The problem is particularly relevant for the University Hospital, which is defined as a third party that makes resources available to the university.

Auditing and Control

Description of National Funders' Auditing Practices

Audits are usually ex-post and undertaken by external auditors (either the funder itself or an audit company). Audits can be either financial or technical.

Similarities and Inconsistencies Between EU and National Auditing Practices

LMU Munich and TU Braunschweig both have a framework contract with an experienced EU funded project auditor for first level Horizon 2020 audits. The procedures involved are similar to national audits.

LMU Munich regularly undergoes second level audits and has observed divergences in auditors' EU experience. They sometimes have little knowledge of the EU participation rules (for example, MSCA actions' exclusive use of lump sums). Furthermore, the auditors are not necessarily national companies and are not always familiar with German accounting practices, which requires additional explanations. These issues are specific to European projects and do not occur under national ones, where the auditors work in Germany and have a good knowledge of the funding rules and accounting procedures.

TU Braunschweig received a second level Horizon 2020 project audit in 2017. The auditing procedure was more detailed than FP7 or national audits (e.g. standard practices like travel cost calculations were examined in depth) and all documents had to be provided electronically, making this audit more time-consuming. Sometimes it was difficult to comply with the auditor's requests. For instance, TU Braunschweig had to provide proof that employees had actually been paid. This information is difficult for the university to provide as such payments are issued by the state.

NETHERLANDS

The development of a cost accounting methodology at Dutch universities

Most universities have implemented full costing methodologies in the Netherlands. Drivers for implementation included the terms and conditions of contract research, which offer institutions that can identify the full costs of their activities a better cost recovery rate, and the need for reliable financial information to support internal decision-making. The Dutch Government has not required universities to implement full costing despite their considerable financial and operational autonomy.

In 2007, driven by the 7th Framework Programme (FP7) and its cost reimbursement methods, all Dutch universities agreed to respect a set of specific principles in developing their full costing methodology. On the advice of the Association of Universities in the Netherlands (VSNU), these were approved by the individual universities. The aim was to secure a set of common definitions and to achieve comparable full cost rates.

However, each university has since worked individually on designing and implementing a full costing methodology without support or guidelines from the national authorities. This has resulted in a very diverse situation. Most universities now use a full costing methodology, which allows them to identify the costs of most of their activities. However, at many institutions the system is not integrated into the financial system and runs in supplementary systems. Some institutions have implemented a very sophisticated methodology that also allows them to use full costing to make strategic decisions.

Universities informally exchanged experiences and good practices very actively when developing full costing. These exchanges specifically addressed principles of time allocation, ways to separate indirect costs for teaching and for research, the relevance of specific cost drivers and the overall model into which the chosen parameters would be integrated. However, there was some reluctance to develop the system further, as this would require additional changes to financial systems and a change of institutional management culture.

In 2012, a coordinated initiative explored whether the national research council would accept full costing methodologies. This was considered another potential driver for further development of this system at Dutch universities. However, the national research council had still not accepted full costing methodologies at the beginning of 2018.

Universities that have implemented full costing as standard have achieved better cost recovery rates for some contract partners, increased cost awareness at all levels of the organisation, and identified opportunities to reduce costs.

Box 4. The accounting model implemented at the University of Amsterdam

University of Amsterdam: founded in 1632, approximately 33,000 students, over 5,000 staff. Comprehensive university.

Staff costs are by far the biggest expense. As salaries are paid monthly, these costs are time-driven by nature. Most non-staff costs related to the facilities they use are also time driven (e.g. rent, energy, cleaning, depreciation, interest, etc). Therefore, measuring the time spent on (academic) staff activities was believed to be the most suitable key for allocating (most) university costs.

However, since Dutch universities are not obliged to state the (full) costs of teaching and research separately in their annual report, there was previously little pressure to implement a time allocation system. Universities reported cost elements (staff costs, material costs, etc.) and cost centres (faculties, support units, etc). There was no need to report the final cost categories (teaching, research and other activities).

The situation changed when research contracts began representing a considerable proportion of universities' activities. The need for a system that separated the costs of the different activities became more urgent, as most research contracts required a detailed report of the project costs incurred. Most universities in the Netherlands started to develop a system of time distribution (some were more detailed than others).

The situation changed when research contracts began representing a considerable proportion of universities' activities. The need for a system that separated the costs of the different activities became more urgent, as most research contracts required a detailed report of the project costs incurred. Most universities in the Netherlands started to develop a system of time distribution (some were more detailed than others).

In the 1990s, the University of Amsterdam started applying a simple procedure to the payroll system output: a proportion of a project employee (involved in a contract project with specific cost reporting conditions) salary was separated out and charged to a separate project account, according to the proportion of time spent on the project under the project contract.

In the course of time the university noticed two disadvantages to this approach: a) it did not reflect the actual time spent and b) it only charged direct staff costs (gross salaries) to projects.

Most contract partners do not accept pre-calculations or assumptions: they are only willing to reimburse costs based on actual data, which reflects the cost of actual time spent. Some contract partners accept values based on full costing. The initial simple system's inability to accommodate these two principles led the University of Amsterdam to completely redesign its costing system.

This redesign process recognised that it was useful to know the full costs, based on time allocation for all staff for all activities (not only contract research). The university therefore implemented a costing system in which staff time is the central cost indicator. In this system, contract researchers can record the actual time they spent on projects with the required level of detail under the contract conditions. This system is presented to them in the form of an employee self-service web-based portal. At the same time, timesheets are generated for all other academic and support staff, based on the data collected about the time assigned to their different activities, as agreed in their appointments and work schedules. As a result, information on the time spent by all staff is provided, whether this information derives from actual entry by the individual employee, or automatic generation by the system in the background based on planning data.

This dual time recording system is directly integrated in the HR system, the project system and the financial system. This allows the University of Amsterdam to charge the full costs according to the appropriate salary level of each individual plus the relevant full cost rate components, to the accounts of each individual project or activity (teaching, research), regardless of the nature of the funder. The full costs of each activity can therefore be compared against the available budgets, for both contract and regular activities.

As a result, information on cost objects can also be included in the university's annual financial report, even though this is not mandatory in the Netherlands. The information gained helps the University of Amsterdam play a leading role in discussions about cost recovery and ways to implement policy decisions with financial implications with its partners (Ministry of Education, National Research Council, other contract parties). The time recording system is an essential part of the University of Amsterdam's full costing methodology and has been certified for use in FP7 by the European Commission.

Institutional accounting practices accepted by national research programme funders

The information included in the following table refers to practices applied at the University of Amsterdam.

Calculation of the Different Cost Items to be Reimbursed	Description of the Accounting Practice Used	Can Nationally-accepted Practices be used for EU Funded Projects
1. Staff cost calculations		
a. Description of eligible staff cost elements and calculation methods (salary components, sick leave, holidays, pension, etc.)	Full costs can be divided into direct and indirect components. The direct component is defined as the salary (scale/step under the university's collaborative work agreement (CAO)), social security contributions and holidays.	The direct component is used as the unit cost under Horizon 2020. FP7 used the complete full costs. In the Netherlands, the direct component (or actual salary) is used for the national research council and full costs are used for national government grants.
b. Use of unit costs or other options to reimburse staff costs	The direct component of the full costs (cf. point 1.a.) is used as the unit cost for Horizon 2020.	Dutch universities found it difficult to obtain unit cost certification under Horizon 2020. For instance, the University of Amsterdam obtained certification for its methodology for calculating (full) unit costs under FP7. However, the institution stopped applying for certification under Horizon 2020 due to the length of the process and the amount of information requested. The University of Amsterdam continues to use the same system based on direct unit costs and hopes to obtain approval through the recent EU audit.
c. Staff cost calculation period (actual, past year, etc.)	Staff costs are calculated for the actual period of the claim.	No adjustment necessary.
d. Description of how staff time is accounted for/recorded (timesheets, profiles, fixed time, contract, etc.)	Time spent by staff is the central cost indicator in the full costing model implemented at the University of Amsterdam. Contract researchers can record the required level of detail for the actual time spent on projects according to contractual requirements. This system is presented to them in the form of an employee self-service web-based portal. At the same time, timesheets for all other academic and support staff are generated based on the data collected about time spent on their different activities, as agreed in their appointments and work schedules. As a result, information on the time spent by all staff is provided, whether provided by actual data entry by the individual employee, or automatic generation by the system based on planning data.	No adjustment necessary. All contract researchers record actual time spent.
e. Statements and documents to justify staff costs	Print screens from the HR system, appointment letter and certified timesheets.	No adjustment necessary.

2. Other direct cost calculations		
a. Equipment (depreciation: amounts and time, etc.)	Time of depreciation of equipment in contract research is equal to the duration of the contract.	Under Horizon 2020, the standard depreciation time of 60 months is used for all equipment worth over 10,000 euros, except IT equipment.
b. Infrastructure (recorded as a direct cost, depreciation, etc.)	Infrastructure costs are calculated as indirect costs.	No adjustment necessary.
c. Other Direct Costs	Other Direct Costs are calculated as actual costs, based on invoices and staff expenses claims.	No adjustment necessary.
3. Indirect cost calculations		
a. Description of the calculation of indirect costs including cost drivers	Indirect costs are calculated using the full costing model applied at the University of Amsterdam.	In 2015, 25% of the University of Amsterdam's indirect costs were covered by the EU project flat rate; in 2016 it was 23% and in 2017 it was 18%. In 2015 part of EU funded projects were covered by FP7, under which the UoA claimed full costs. The value of FP7 projects went down over time, which explains the diminishing percentage of indirect costs covered.
4. Internal invoicing		
a. Description of internal invoicing procedures	N/A	N/A
5. Other relevant elements for cost reimbusements		
	N/A	N/A
Auditing and Control	**Description of National Funders' Auditing Practices**	**Similarities and Inconsistencies Between EU and National Auditing Practices**
1. Description of procedures, audit types, reporting deadlines, etc.	The National Research Council does not audit individual projects. Other national grant providers require a standard audit if the amount awarded is over 125,000 euros. Reports are due 6 months after the end of the contract.	The EU requires a factual finding report instead of a standard report. Audit reports are therefore more expensive and time consuming. More information is needed to justify costs, i.e. participant lists and meeting notes. The EU requires reports to be submitted 60 days after the end of the contract.

POLAND

The development of a cost accounting methodology at Polish universities

FP7 and its cost reimbursement methods fostered discussions about the development of a full costing methodology in Poland. Universities, other FP7 beneficiaries, and the Polish National Agency for the Promotion and Support of applicants to the Framework Programme started debating the implementation of full costing at Polish universities. In 2007 and 2008, the Polish Ministry of Higher Education announced plans to increase the budget for competitive grants and to reduce institutional core funding. This raised universities' awareness of the need to improve identification of the costs of their activities. In 2009 and 2010, public discussions on higher education funding and costs further underlined the need for transparent financial management.

Current developments also concern new funding models for higher education establishments. In autumn 2018 the country will undergo significant regulatory changes, mainly through the introduction of a new algorithm for calculating core funding. The Ministry intends to increase core funding but will substantially increase in parallel the size of competitive grants.

Despite discussions about the importance of full costing, no Polish universities except the University of Lodz, have implemented this methodology. Lodz started implementing a comprehensive financial management system in 2012. The solutions used were based on the experiences of European universities participating in the EUIMA - Full Costing Project.

However, the University of Lodz initiative was not supported at system level by a coordinated approach or governmental support in the form of human or financial resources. The regulations on the financial management of higher education that came into force in 2011 posed additional obstacles to the development of a coherent methodology. The legislation did not sufficiently consider universities' research activities, or the flat rate system used to calculate indirect costs both at national and European level.

Institutions responded to the 2011 legal provisions on financial management and accounting by prioritising the implementation of changes not linked to full costing. The need to adapt university IT systems poses another challenge as only the biggest public universities have implemented integrated management systems including HR, accounting and project management modules.

Box 5. Full costing methodology design at the University of Lodz

The starting point for developing the methodology at the University of Lodz was the creation of a project team to develop a Comprehensive Information System (CIS) for managing the University in the mid-2000s. The team included about twenty teaching and research employees. Accounting systems developed as early as 2007 covered the basic elements of financial accounting (accounts statements, financial reporting) and the assumptions and accounting system management methods, such as multi-task costs and results accounting, transferred prices used to value internal services and a performance measuring system. The CIS was fully implemented at the University of Lodz in July 2012.[6]

This system assumes that the university carries out teaching and research activities in the form of projects (lasting one or several years). The university's second core activity is research, which includes scientific research and development and the provision of research services. Research is carried out in the form of research projects with different implementation periods and funding sources. The university's third fundamental activity is organisational processes, which are covered by project management, due to their specific nature.

The following processes were identified to measure the costs, revenues and profits of the university's various statutory tasks, in order to integrate them in future process-oriented management:

6 Irena Sobańska, Agnieszka Wencel, Jacek Kalinowski, Project Management in Universities - Accounting Payroll on the Example of the University of Lodz, Social Sciences, 2014, Nr 1 (83).

- Education
- Financial assistance (for students)
- Human resource management
- Infrastructure
- Logistics
- Marketing
- Research processes
- University development
- University management

The resulting multi-purpose system combines the functions of different cost systems, including:

- A standard marginal costing system (multi-step and multi-block)
- A standard full costing system (ABC) with separate cost statements for the basic university processes
- Project life-cycle costing

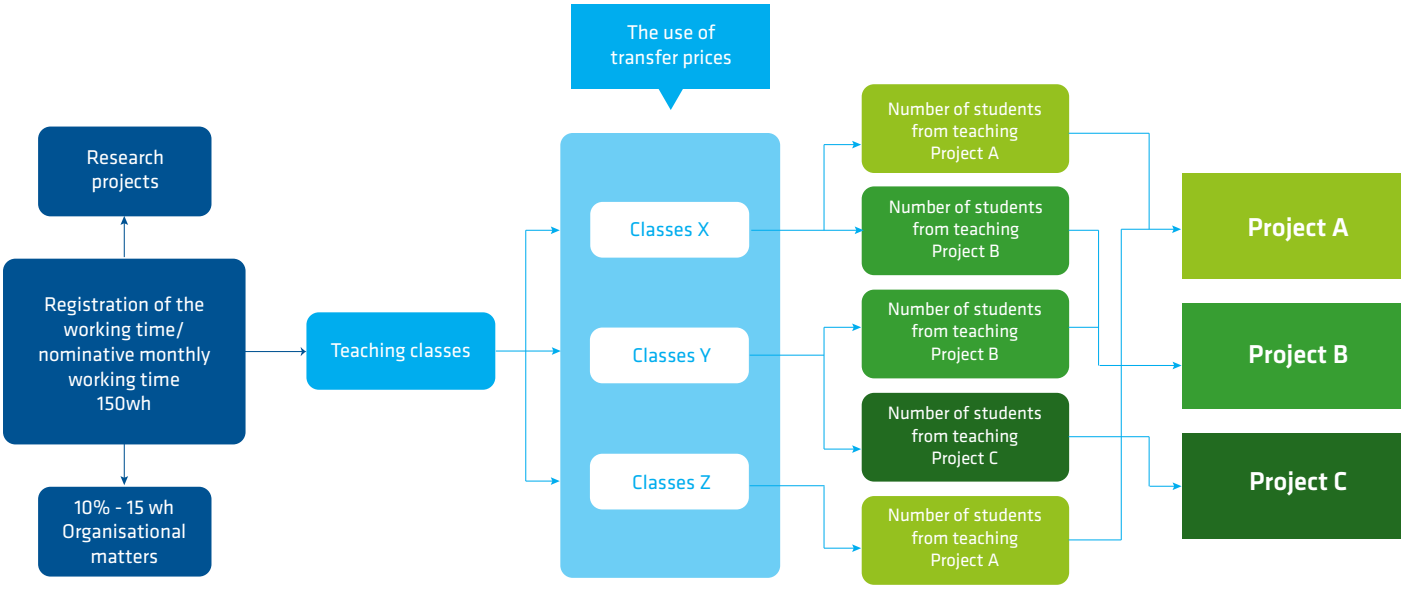
The system considers the university's hierarchical organizational structure. Responsibility for accounting is assigned at all management levels by designating the centres responsible for costs, gross margins and profits.

Bottom-up budgeting is implemented based on guidelines prepared by the top management.

Performance measurement for the entire university and for individual internal units is based on applying a balanced scorecard principle.

The new internal reporting structure was designed to be suitable for the decentralized management system (budget execution reports, multi-step profit and loss reports, parametric assessment reports in line with the balanced scorecard structure).

Figure 5. Cost calculation at the University of Lodz



Institutional accounting practices accepted by national research programme funders

Information included in the following table refers to practices implemented at the University of Lodz (UL).

Calculation of the Different Cost Items to be Reimbursed	Description of the Accounting Practice Used	Can Nationally-accepted Practices be used for EU Funded Projects
1. Staff cost calculations		
a. Description of eligible staff cost elements and calculation methods (salary components, sick leave, holidays, pension, etc.)	All the salary components calculated through the full costing methodology are reimbursed. Staff costs are calculated on an hourly basis and include the following cost types: • Gross remuneration • Compulsory employee social insurance • Other mandatory benefits • Some indirect costs from the internal unit that employs academic teachers	The University of Lodz is able to apply institutional practices for calculating the costs incurred by different types of projects funded by the national authorities, EU funding programmes (including Horizon 2020) and the private sector. The university's full costing system can be adjusted to calculate the costs of any research project. If a project requires a different accounting procedure, the change can be implemented in the system in the first full costing model calculation. Costs will therefore be calculated and integrated accordingly into the IT system.
b. Use of unit costs or other options to reimburse staff costs	N/A	The institution did not apply for unit cost certification (CoMUC) under Horizon 2020.
c. Staff cost calculation period (actual, past year, etc.)	Actual project costs are calculated annually as they depend both on salaries (which are constant) and the number of classes (which varies monthly). The UL is only able to calculate actual costs at the end of the year (particularly for teaching projects) as the method of calculating academic staff costs is based on transfer prices rather than actual costs.	N/A.

<table>
<tr><td>d. Description of how staff time is accounted for/recorded (timesheets, profiles, fixed time, contract, etc.)</td><td colspan="2">The University of Lodz assigns academic staff payroll costs according to the following table:

<table><tr><th rowspan="2">University Staff Category</th><th colspan="3">Payroll Cost Allocations</th></tr><tr><th>Teaching</th><th>Research</th><th>Organizational</th></tr><tr><td>Academics</td><td>Transfer Prices</td><td>Actual Costs</td><td>Actual Costs</td></tr><tr><td>Teaching and research staff</td><td>Working time schedules</td><td>Working time schedules</td><td>10%</td></tr><tr><td>Teaching staff</td><td>Working time schedules</td><td>---</td><td>10%</td></tr><tr><td>Researchers</td><td>---</td><td>Working time schedules</td><td>10%</td></tr><tr><td>Librarians</td><td>Working time schedules</td><td>Working time schedules</td><td>10%</td></tr></table></td></tr>
<tr><td>e. Statements and documents to justify staff costs</td><td>Working time schedules.</td><td>No adjustment necessary.</td></tr>
<tr><td colspan="3">2. Other direct cost calculations</td></tr>
<tr><td>a. Equipment (depreciation: amounts and time, etc.)</td><td>Depends on the period of use.</td><td>N/A</td></tr>
<tr><td>b. Infrastructure (recorded as a direct cost, depreciation, etc.)</td><td>Standard costing method: this calculation method allows the university to define the infrastructure costs for the exact period of use.</td><td>N/A</td></tr>
<tr><td>c. Other Direct Costs</td><td>N/A</td><td>N/A</td></tr>
<tr><td colspan="3">3. Indirect cost calculations</td></tr>
<tr><td>a. Description of the calculation of indirect costs including cost drivers</td><td>The actual payroll costs for academic teaching staff are compared to the cost of remunerations based on transfer prices charged to the various educational projects at the end of each calendar and each academic year. Any deviations from the transfer prices are charged to teaching projects.</td><td>N/A</td></tr>
<tr><td colspan="3">4. Internal invoicing</td></tr>
<tr><td>a. Description of internal invoicing procedures</td><td>N/A</td><td>N/A</td></tr>
</table>

Auditing and Control	Description of National Funders' Auditing Practices	Similarities and Inconsistencies Between EU and National Auditing Practices
1. Description of procedures, audit types, reporting deadlines, etc.	The same bookkeeping system is used to provide information to national and European auditors.	In some cases European auditors required documentation justifying the exact price of equipment such as computers, however the system only stores actual costs, meaning that factors such as depreciation are already taken into account.

PORTUGAL

The development of a cost accounting methodology at Portuguese universities

In 2007, a new legal framework for higher education set new rules for university governance, which included specific accounting regulations. Although this theoretically paved the way for cost accounting, national research funding schemes remained unchanged. Portuguese researchers are therefore predominantly accustomed to securing research funds on an additional cost basis.

Full costing methodologies were only considered relevant for FP7 projects. FP7 reimbursement rules were among the main drivers for discussions on the development of full costing. However, there was no coordinated approach at system level or government support.

Nonetheless, a few universities started to develop a methodology that was also seen as a strategic management tool, even prior to the impact of European funding. The University of Coimbra started a pilot project at one faculty in 2002 and extended it to other faculties in the following years. By the early 2010s, four universities had more advanced full costing methodologies in place. Some of the institutions that discussed implementation faced major difficulties due to a highly autonomous faculty structure. Clear leadership commitment and communication efforts were usually key to achieving progress. In general terms, full costing discussions became livelier in the early 2010s.

However, full costing model discussions dwindled due to simplification of the Horizon 2020 indirect cost rules. In fact, most competitive research programme funders have simplified indirect costs by using flat rates, which are generally based on Horizon 2020 rules.

Institutional accounting practices accepted by national research programme funders

The information included in this table refers to practices applied at the University of Aveiro and at the University of Coimbra.

Calculation of the Different Cost Items to be Reimbursed	Description of the Accounting Practice Used	Can Nationally-accepted Practices be used for EU Funded Projects
1. Staff cost calculations		
a. Description of eligible staff cost elements and calculation methods (salary components, sick leave, holidays, pension, etc.)	Permanent and additional staff costs are eligible for funding under almost every national funding programme. These costs include gross salaries, meal allowances and compulsory national social security charges (22.3% or 23.75% of the gross salary depending on the type of contract). The total annual costs are calculated as follows: gross salaries x 14 months (+ 1% social charges) + 4.77 euros meal allowance per working day/actual n° of working hours).	No adjustment necessary.
b. Use of unit costs or other options to reimburse staff costs	N/A	Neither the University of Aveiro or University of Coimbra applied for unit cost certification under Horizon 2020.
c. Staff cost calculation period (actual, past year, etc.)	While the University of Coimbra generally uses the previous financial year as the basis for calculating staff costs (only some projects require monthly calculations), the University of Aveiro calculates staff costs for the actual project implementation period. The actual number of productive hours is calculated for each employee on the basis of actual time records.	Horizon 2020 project staff costs are based on the previous financial year. While no adjustments are therefore needed at the University of Coimbra, they are required for staff cost calculations at the University of Aveiro.
d. Description of how staff time is accounted for/recorded (timesheets, profiles, fixed time, contract, etc.)	Timesheets are drafted on the basis of time spent on projects and other activities, such as teaching or holidays and are signed by researchers and approved by the lead researcher. At the University of Aveiro, staff do not have to complete timesheets if they only work on one project. Fixed time allocations are used for INTERREG programmes.	No adjustment necessary.
e. Statements and documents to justify staff costs	Work contracts, payslips, proof of all payroll items including social security contributions and proof of registration in the accounts.	No adjustment necessary.

2. Other direct cost calculations		
a. Equipment (depreciation: amounts and time, etc.)	Depreciation costs are eligible for funding, when calculated on the basis of project duration and use. National Law defines the annual depreciation rate for each equipment type used by public institutions. For example, the rate for hardware is 25% or for scientific equipment is 20%. Equipment costs can only be reimbursed on the basis of the extent to which they are used during the project.	No adjustment necessary.
b. Infrastructure (recorded as a direct cost, depreciation, etc.)	Generally speaking, only equipment depreciation costs are eligible.	No adjustment necessary.
c. Other Direct Costs	Other Direct Costs reimbursed by national funders include travel and related subsistence allowances, and other goods and services. The University of Aveiro assigns each project a dedicated cost centre, where all direct costs are registered and presented to funding agencies using national accounting system categories and project rules. The institution uses an application that links the national categories to the project categories.	No adjustment necessary.
3. Indirect cost calculations		
a. Description of the calculation of indirect costs including cost drivers	The University of Coimbra calculates indirect costs as a 25% flat rate of direct costs (minus subcontracting, costs incurred by third parties not used on the beneficiaries' premises and the costs of providing financial support to third parties).	No adjustment necessary.
4. Internal invoicing		
a. Description of internal invoicing procedures	Not applicable for competitive research programmes funded by national funding agencies.	Internal invoicing procedures not applied to Horizon 2020 projects.
Auditing and Control	**Description of National Funders' Auditing Practices**	**Similarities and Inconsistencies Between EU and National Auditing Practices**
1. Description of procedures, audit types, reporting deadlines, etc.	N/A	Audits are generally subject to the same rules as EU funded projects as most competitive research programmes are funded by Horizon 2020. However, reports are generally due every six months, which is a shorter reporting period than Horizon 2020.

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