

Deliverable 1.3

Final Evaluated Business and Procurement Models

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DoW	<p>Task 1.3: Validation and Consolidation of Business Models and Procurement Schemes</p> <p>During the analysis of existing procurement models (Task 1.1) and based on the documentation of identified obstacles in the procurement processes (Task 1.2) the development of a proposal how to improve/change existing procurement regulations in selected European regions will be developed by BAM (D 1.3) aiming to support an efficient, holistic, and consistent installation of system integration components. (result: D1.3; TL: BAM)</p> <p>D1.3: Final Evaluated Business and Procurement models</p> <p>Report: the initial proposals will be evaluated during the project and in other related projects of industry partners. Lessons learned will lead to adaptations.</p>		
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TABLE OF CONTENTS

Table of contents	iii
1. Executive summary	4
1.1 Publishable summary.....	4
2. Introduction	5
2.1 Task description and Objectives	5
2.2 Purpose and target group	5
2.3 Contributions of partners.....	5
3. Review from previous deliverables.....	6
3.1 Introduction	6
3.2 Review from D1.1	6
3.3 Review from D1.2	7
4. Evaluation of the business models.....	8
4.1 Work approach.....	8
4.1.1 SWOT analysis	8
4.2 Evaluation of the three Business Models	9
4.2.1 Detailed SWOT assessment of each canvas block	9
4.2.2 Assessing Threats	13
4.2.3 Assessing opportunities	14
4.3 Findings related to suitability to current situation	17
4.4 Findings related to Procurement Schemes.....	18
5. Discussion.....	19
6. References	20

1. EXECUTIVE SUMMARY

1.1 Publishable summary

This document report on the evaluation and comparison of three business models suggested in D1.2 regarding the introduction of the ICT platform as developed during the CAMPUS-21 project. The ICTO model, the IECCO model and the ICTAM model have been evaluated and compared following the work approach introduced by Osterwalder and Pigneur. The evaluation considered several area including opportunities and risks related to the nine blocks of the business model canvas. The evaluation reveals that the ICTAM model is most innovative and high potential model. However, this work package recommends on the application of the IECCO model as the most realistic and low risk business model.

2. INTRODUCTION

2.1 Task description and Objectives

Task 1.3: Validation and Consolidation of Business Models and Procurement Schemes.

During the analysis of existing procurement models (Task 1.1) and based on the documentation of identified obstacles in the procurement processes (Task 1.2) the development of a proposal how to improve/change existing procurement regulations in selected European regions will be developed by BAM (D 1.3) aiming to support an efficient, holistic, and consistent installation of system integration components.

2.2 Purpose and target group

This document details the evaluation of and the comparison between the three business models suggested in D1.2. The focus of this document is the outcome of the evaluation based on the approach introduced in the ‘Business Model Generation’.

This document, complementing work in WP1, provides recommendation on the most suitable business model for the deployment of the ICT platform.

2.3 Contributions of partners

BAM, as task leader and the only partner involved in this task, finished the whole work including: developing the ToC, work approach, using the evaluation template and writing D1.3.

3. REVIEW FROM PREVIOUS DELIVERABLES

3.1 Introduction

The European Union is committed to taking the lead towards more sustainable energy consumption and production in the global economy. One of the approaches is to use renewable energy sources. The 2009 Directive on the "Promotion of the use of energy from renewable sources" not only set the mandatory targets for the European Union's Member States, but also drafted a trajectory how to reach the targets for each of them. However, the existing ICT-components of energy management systems have deficits to efficiently and effectively integrate novel and innovative energy production and storage components on building and campus level. Furthermore, sensed and metered data from existing security, safety, and Building Automation Systems are not effectively and holistically compiled, managed, and analysed. Therefore, the exploitation of this available data for predictive control of energy consuming systems is currently unsatisfactory. The introduction of these new integrated ICT platforms should go through new business models that takes into consideration some important issues related to: the collaboration between the different campus partners, integration of activities and resources, existing contractual and financial relationships and exiting procurement schemes.

3.2 Review from D1.1

Due to the dis-continuous nature of energy production from renewable sources it is important that advanced ICT-monitoring, control and decision support tools are developed and deployed to support an optimal operation of building-services systems, micro-generation components, and energy storage systems within campuses. Furthermore, it is important that building control components (e.g. smart meters), control components of local energy distribution grids and interface components to national energy distribution systems can easily communicate with each other and exchange relevant information about the available supply capacity, flexible tariffs and the required and desired energy demand in buildings and on campuses.

CAMPUS 21 addressed the integration deficit of existing building automation, security, and safety systems to jointly use sensed and monitored data to manage, optimise the control and operation of energy systems in buildings and local energy distribution grids. It addressed these challenges by bringing together partners representing the whole value chain of "Total Facilities and Energy Management".

The supply chain for holistic energy management is fragmented. Stakeholders with different, sometimes contradicting, business goals are part of this supply chain. New business models need to be developed to support a "cross-sectorial" collaboration of partners from the ICT, the construction, and the energy sector with each other – in the best interest of their clients – the owner and tenants of residential, commercial and industrial facilities.

There is a need to develop new ICT-enabled business models for Integrated Energy-Systems-Management. These business models have to enable owners and operators to decide how to use energy from renewable sources (use in building, store locally, re-distribute on campus, or sell to grid). There is a need to determine the relevant parameters to be considered by distinct stakeholders (user comfort, energy prices, carbon taxes, operation and maintenance cost) and what underpinning ICT methods and tools are required (interoperability, data management and advanced control).

3.3 Review from D1.2

During the work on T1.2, three business models have been suggested for the introduction of the new integrated platform. All three models have been based on existing business models and supported by ICT-based elements. These models are: ICT-based Outsourcing (ICTO), Combined IEC and CC (IECCo) and ICT-based Asset Management (ICTAM).

All these new business models have been discussed from organizational, financial and procurement point of view providing a good basis for comparing the business models in relation to their expected potentials.

Risks related to the introduction of the integrated ICT platform in the context of the new business models have been discussed from technical, operational, management and contractual point of view providing a good basis for a strong SWOT analysis.

Finally the new introduced business models have been compared to each other to find out which model(s) can better suit for the introduction of the integrated ICT platform. The comparison revealed that the evaluation of the new business models vary for the different evaluation criteria. The ICTO scored relatively better on the suitability to the complexity and existing business issues. The ICTAM scored relatively better on the advantages for both the facility company and the building owner and less on the complexity of the model. Finally, the IECCo scored relatively good on, almost, all evaluation criteria.

In T1.3, the three business models will comprehensively be compared to each other and evaluated according to the method introduced by Osterwalder and Pigneur. D1.3 reports on the evaluated business model(s) for the purpose of the introduction of the ICT platform.

4. EVALUATION OF THE BUSINESS MODELS

4.1 Work approach

A business model is an important management activity that allows an organization to evaluate the health of its market position. This check-up may become the basis for incremental business model improvement, or it might trigger a serious intervention in the form of a business model initiative. As the automobile, newspaper, and music industries have shown, failing to conduct regular check-ups may prevent early detection of business model problems, and may even lead to a company's demise.

In this chapter, we adopt the point of view of an existing business model and analyse external forces from the inside out. The analysis will be based on a set of checklists for assessing business model's strengths, weaknesses, opportunities and threats for each block of the business model canvas. This approach has been introduced by [Osterwalder & Pigneur, 2013] in their book 'Business Model Generation'. This approach has been applied in different sectors providing a broad recognized and accepted evaluation of business models.

4.1.1 SWOT analysis

Assessing business model's overall integrity is crucial, but looking at its components in detail can also reveal interesting paths to innovation and renewal. An effective way to this is to combine classic SWOT analysis with the business model Canvas [Osterwalder & Pigneur, 2013]. SWOT analysis provides four perspectives from which to assess the element of a business model, while the Business Model Canvas provides the focus necessary for a structured discussion.

SWOT analysis is familiar to many businesspeople. It is used to analyse an organization's strengths and weaknesses and identify potential opportunities and threats. It is an attractive tool because of its simplicity, yet its use can lead to vague discussions because its very openness offer little direction concerning which aspects of an organization to analyse. A lack of useful outcomes may result, which has led to certain SWOT-fatigue among managers. When combined with the business models canvas, SWOT enables a focused assessment and evaluation of an organization's business model and its building blocks.

SWOT asks four big but simple questions:

- What are your organization's strengths?
- What are your organization's weaknesses?
- What opportunities does your organization have?
- What potential threats does your organization face?

The first two questions look at helpful areas and other two address harmful areas. It is useful to ask these four questions with respect to both the overall business model and each of its nine building blocks. This type of SWOT analysis provides a good basis for further discussions, decision-making, and ultimately innovation around business models.

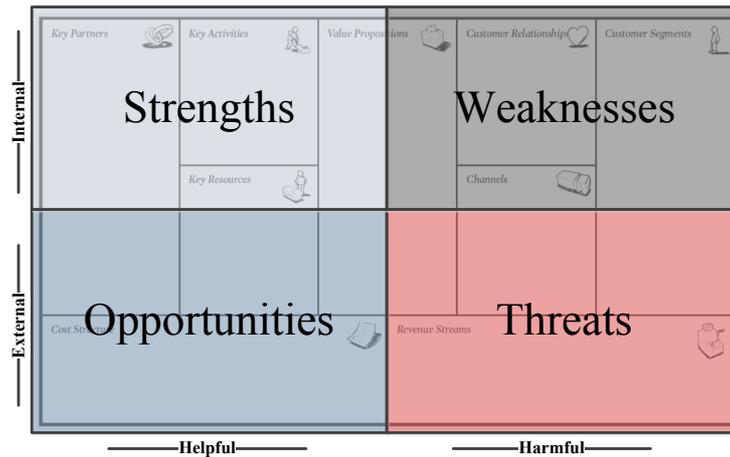


Figure 4-1: SWOT analysis for the business model canvas

The SWOT analysis will be performed to the three suggested business models: ICTO (ICT-based Outsourcing), IECCo (Combined IEC and CC) and ICTAM (ICT-based Asset Management). Due to the fact that all these business models haven’t been applied in practice in the two campuses, we will try to assess and compare them based on our experience in relation to the existing businesses and our discussion with involved parties.

4.2 Evaluation of the three Business Models

4.2.1 Detailed SWOT assessment of each canvas block

Value Proposition Assessment	ICTO	IECCO	ICTAM
Our value propositions are well aligned with customers’ needs	**** The ICTO will only consider beforehand agreed customers’ needs	***** The IECCO may discover additional customers’ needs during the operation of the project	***** The ICTAM may discover additional customers’ needs during the operation of the project
Our value propositions have strong network effects	***	***** The IECCO requires stronger networking and will result in more network effects	***** The ICTAM requires stronger networking and will result in more network effects
There are strong synergies between our products and services	**** In the ICTO we have clear picture about our products and services	**** In addition to the ICTO, the IECCO has more potential for higher synergies between products and services	**** In addition to the ICTO, the ICTAM has more potential for higher synergies between products and services
Our customers are very satisfied	N.A.	N.A.	N.A.
Summary: both IECCO and ICTAM score better on both beforehand agreed customers’ needs and afterwards business potentials. These models may provide a strong value proposition for the facility company			

Revenue Assessment	ICTO	IECCO	ICTAM
We benefit from strong margins	** Only beforehand agreed services	**** High potentials for stronger margins during the project	***** High potentials for stronger margins during the project
Our revenues are predictable	*** Revenues may suffer from weather and occupancy factors	**** Revenues may suffer from weather and occupancy factors but may benefit from energy synergies	***** Revenues may suffer from weather and occupancy factors but may benefit from energy and work processes synergies
Our revenue Streams are diversified	*** Revenue streams are known and are not very diverse	**** More possibilities to have additional revenue streams	***** More possibilities to have additional revenue streams
Our Revenue Streams are sustainable	**** Revenue streams are sustainable but their levels may suffer from seasonal and weather factors	**** Revenue streams are sustainable but their levels may suffer from seasonal and weather factors	**** Revenue streams are sustainable but their levels may suffer from seasonal and weather factors and from issues related to involved assets of the owner
We have recurring revenue streams and frequent repeat purchases	Not applicable	Not applicable	Not applicable
We collect revenues before we incur expenses	** Up-front investment for implementing the ICT platform is required for collecting revenues	** Up-front investment for implementing the ICT platform is required for collecting revenues	** Up-front investment for implementing the ICT platform is required for collecting revenues
Our pricing mechanisms capture full willingness to pay	***** Based on beforehand agreed payments	**** May depend on potential savings during the projects	**** May depend on potential savings during the projects
Our costs are predictable	***** Costs are based on agreed services and activities	**** In addition to ICTO, costs may proportionally vary in relation to additional energy savings	**** In addition to ICTO, costs may proportionally vary in relation to additional energy savings
Our cost structure is correctly matched to our business model	***** Cost structure matches the business model	***** Cost structure may suffer from lower achieved energy costs	***** Cost structure may suffer from lower achieved energy costs
Our operations are cost-efficient	*** Operations may suffer from additional activities related to data quality	*** Operations may suffer from additional activities related to data quality	*** Operations may suffer from additional activities related to data quality
We benefit from strong margins	**** Margins depend on additional energy	**** Margins depend on additional energy	**** Margins depend on additional energy

	savings achieved by the team	savings achieved by the team	savings achieved by the team
Our revenues are predictable	**** Revenues are predictable and are agreed in advance	*** Revenues are not predictable and depend on weather conditions and efforts by the operating team	*** Revenues are not predictable and depend on weather conditions and efforts by the operating team
<p>Summary: regarding the revenue streams, the ICTO is the most predictable model and may provide sustainable revenue levels. However, this model doesn't profit from all energy saving potentials at the campus level. Conversely, both the IECCO and the ICTAM benefit from energy saving potentials at the campus level involving further energy saving measures and improving owner assets.</p>			

Cost Assessment	ICTO	IECCO	ICTAM
Our costs are predictable	*** Costs are predictable and based on beforehand planned activities. In some cases, higher costs may occur due to data quality problems	** Costs are less predictable than ICTO due to additional activities related to higher levels of energy saving potentials and activities	** Costs are less predictable than ICTO due to additional activities related to higher levels of energy saving potentials and activities
Our cost structure is correctly matched to our business model	**** Costs are correctly matched to revenue streams	**** Costs are correctly matched to revenue streams	**** Costs are correctly matched to revenue streams
Our operations are cost-efficient	**** Fully automated operations are cost efficient	**** Fully automated operations are cost efficient	**** Fully automated operations are cost efficient
We benefit from economies of scale	**** The centralized DACM components may be used for multiple different sites	**** The centralized DACM components may be used for multiple different sites	**** The centralized DACM components may be used for multiple different sites
Our revenues are predictable	*** Revenues are not easily predictable and may suffer from some external factors e.g. weather	*** Revenues are not easily predictable and may suffer from some external factors e.g. weather and further energy saving measures.	*** Revenues are not easily predictable and may suffer from some external factors e.g. weather, energy saving measures and feasibility of improving assets
<p>Summary: regarding costs structures, the ICTO is the most predictable model and may provide manageable cost levels. Conversely, both the IECCO and the ICTAM may be affected by intensive and in some cases not predictable costs related energy saving and asset improvement activities. However, these activities results in higher energy saving levels and work improvement which lead to higher levels of revenue streams.</p>			

Infrastructure Assessment	ICTO	IECCO	ICTAM
Our key resources are difficult for competitors to replicate	***** The ICT platform is developed during the project	***** The ICT platform is developed during the project	***** The ICT platform is developed during the project
Resource needs are predictable	***** Necessary data are predictable	***** Necessary data are predictable, additional activities are required to achieve higher saving levels	***** Necessary data are predictable, additional activities are required to achieve higher saving levels
we deploy key resources in the right amount at the right time	***** Deploying more accurate and correct data results in higher service levels	***** Deploying more accurate and correct data results in higher service levels	***** Deploying more accurate and correct data results in higher service levels
We efficiently execute key activities	***** The most activities are fully automated	**** In addition to ICTO, more data control and analysis activities may result in better revenues	**** In addition to ICTO, more data control and analysis activities may result in better revenues
Our key activities are difficult to copy	***** Key activities are very specific are related to the deployment of the platform	***** Key activities are very specific are related to the deployment of the platform	***** Key activities are very specific are related to the deployment of the platform
Execution quality is high	***** Operating activities have been tested	***** Operating activities have been tested	***** Operating activities have been tested
Balance of in-house versus outsourced execution is ideal	Not applicable	Not applicable	Not applicable
We are focused and work with partners when necessary	**** Partnership is clear	**** Partnership is clear	**** New partnerships may be relevant to achieve higher optimisation levels
We enjoy good working relationship with key partners	***** Deployment of the platform requires strong working relationship with partners	***** Deployment of the platform requires strong working relationship with partners	***** Deployment of the platform requires strong working relationship with partners
<p>Summary: the ICTO model requires lower level of resources and activities to guarantee the beforehand agreed services. However, the IECCO and the ICTAM models require higher level of data (normally not easily accessible). These models can guarantee higher levels of energy saving and process improvement, which very interesting for both the ESCo/asset company as well as for the building owner and user.</p>			

4.2.2 Assessing Threats

Value Proposition Threats	ICTO	IECCO	ICTAM
Are substitute products and services available?	***** All required products and data are available	***** All required products and data are available	***** All required products and data are available
Are competitors threatening to offer better price or value?	*** We execute very exclusive activities	**** We execute very exclusive activities and can provide higher levels then ICTO model	***** We execute very exclusive activities and can provide higher levels then ICTO and IECCO model
Summary: risks related to value proposition are at the same level in the three models talking about comparable level of services. However, the IECCO and the ICTAM may be concerned with higher levels of risks related to higher levels of energy savings and work improvement.			

Cost/Revenue Threats	ICTO	IECCO	ICTAM
Are our margins threatened by competitors? By technology?	*** Our margins may be affected by data quality	**** Our margins may be affected by data quality and risks related to additional energy saving measures	***** Our margins may be affected by data quality and risks related to additional energy saving measures and asset improvements
Do we depend excessively on one or more revenue Streams?	*** Revenue streams come from gains from energy saving	**** Revenue streams come from gains from further energy saving and maintenance costs	***** Revenue streams come from gains from energy saving, maintenance costs and improvement of internal work processes
Which revenue streams are likely to disappear in the future?	*** Revenue streams from energy savings will stabilize	**** Revenue streams from maintenance gains will increase	***** Revenue streams from maintenance and process improvement gains will increase
Which costs threaten to become unpredictable?	**** Data control	*** Data control and activities for higher levels of energy efficiency	** Data control and activities for higher levels of energy efficiency and process improvement
Which costs threaten to grow more quickly than the revenue they support?	**** Data control	**** Data control and energy savings in the first period of the project	**** Data control and energy savings in the first period of the project
Summary: just like other risk assessment! The ICTO model is concerned with lower risks but will result in lower gains. Both the IECCO and the ICTAM models are concerned with higher levels of risks but may result with higher levels of energy saving and better asset management.			

Infrastructure Threats	ICTO	IECCO	ICTAM
Is the quality of our resources threatened in any way?	*** Data quality	*** Data quality and changes in HVAC systems	*** Data quality and changes in assets and related work processes
What key activities might be disrupted?	*** Activities related to collection and stability of data	*** Activities related to collection and stability of data	*** Activities related to collection and stability of data
Is the quality of our activities threatened in any way?	*** Inaccurate data affect HVAC control activities	*** Inaccurate data affect HVAC control activities	*** Accessibility to owner asset may affect activities
Are we in danger of losing any partners?	Not applicable	Not applicable	Not applicable
Might our partners collaborate with competitors	Not applicable	Not applicable	Not applicable
Are we too dependent on certain partners?	**** Businesses depend on data and technology providers (e.g. software update of the ICT platform)	**** Businesses depend on data and technology providers (e.g. software update of the ICT platform)	**** Businesses depend on data and technology providers (e.g. software update of the ICT platform)
Summary: all three models may suffer from lower data quality and have the same level of dependencies on external partners.			

4.2.3 Assessing opportunities

Value Opportunities	ICTO	IECCO	ICTAM
Could we generate recurring revenues by converting products into services?	* All revenues based on beforehand agreed services	*** New revenues may be recurred by intensive data analysis and understanding how systems work	**** New revenues may be recurred by intensive data analysis and understanding how systems work and benefits from owners assets
Could we better integrate our products or services?	* Not applicable	*** Integration may provide higher revenue levels	**** Integration may provide higher revenue levels
Which additional customer needs could we satisfy?	*** Needs already satisfied by IECCO and ICTAM	**** Needs already satisfied by ICTAM	**** Highest level of customer needs are satisfied
What complements to or extensions of our value proposition are possible?	*** Further energy efficiency improvements and support up-front investments	**** Improvement of owner assets	**** Fully optimized

What other jobs could we do on behalf of customers?	*** Activities related to higher efficiency levels and related investments	**** Activities related to improving owner assets	***** Almost all possible activities have been covered
Summary: in relation to value opportunities the ICTAM model covers all possible and potential customers' needs followed by the IECCO and then by the ICTO. However, these opportunities are concerned with higher levels of uncertainties and risks.			

Cost/Revenue Opportunities	ICTO	IECCO	ICTAM
Can we replace one-time transaction revenues with recurring revenues?	*** No on-time transaction but periodically equal payments	**** No on-time transaction but periodically payments related to achieved savings	**** No on-time transaction but periodically payments related to achieved savings and asset improvements
What other elements would customers be willing to pay for?	*** Pre-financed activities related to deeply data analysis and energy saving	**** Activities related to deeply improving owner assets	***** Almost all possible elements have been covered
What other revenue streams could we add or create?	*** Revenues related to higher energy efficiency resulted from deeper data analysis	**** Revenues related to higher energy efficiency resulted from deeper asset analysis	***** Almost all possible revenue have been covered
Where can we reduce costs?	**** Standardisation of data control and analysis activities	**** Standardisation of data control and analysis activities	**** Standardisation of data control and analysis activities
Summary: the ICTO include the most basic elements of improving energy efficiency in an outsourcing contract. However, higher revenue levels are missing. In the IECCO and the ICTAM models, however, higher levels of revenue streams could be generated through additional activities and services (asset management and energy saving measures). Higher levels of revenue streams are concerned with two models.			

Infrastructure Opportunities	ICTO	IECCO	ICTAM
Could we use less costly resources to achieve the same result?	*** Less costly resources are applicable but will result in lower energy saving levels	*** Less costly resources are applicable but will result in lower energy saving levels	*** Less costly resources are applicable but will result in lower energy saving levels and lower benefits from assets
Which key resources could be better sourced from partners?	*** Weather, BMS and security data	*** Weather, BMS, security and HVAC data	*** Weather, BMS, security, HVAC and asset data
Which key resources are under-exploited?	*** Low hanging fruit (not expensive energy saving measures)	**** Not applicable	***** Not applicable

Do we have unused intellectual property of value to others?	Not applicable	Not applicable	Not applicable
Could we standardize some key activities?	**** Data control, improvement and analysis activities	**** Data control, improvement and analysis activities	**** Data control, improvement and analysis activities
How could we improve efficiency in general?	***** Standardisation of activities and calibration of meters and sensors	***** Standardisation of activities and calibration of meters and sensors	***** Standardisation of activities and calibration of meters and sensors
Would IT support boost efficiency?	***** Our activities are fully IT supported	***** Our activities are fully IT supported	***** Our activities are fully IT supported
Are there outsourcing opportunities?	Not applicable	Not applicable	Not applicable
Could grater collaboration with partners help us focus on our core business?	*** Very big room for greater collaboration	**** More room for greater collaboration	***** More room for greater collaboration
<p>Summary: in the IECCO model, and more in the ICTAM model, additional analytical works could provide more energy savings on the campus level and better understanding of the campus assets. This can result in higher revenue streams in those models.</p>			

4.3 Findings related to suitability to current situation

To properly adopt new business model for the two involved demonstration sites, it is very important to evaluate the suitability of the new business models in relation to current financial and contractual relationships.

Suitability in relation to...	ICTO	IECCO	ICTAM
changes in contracts	***** This model is perhaps the most close to current contracts in both demonstration sites. The only change will be related to the ownership both data and ICT platform involved.	**** Both campus operators of the demonstration sites are known with the ESCo model. However, deploying this new ICT platform and the related data, sensors & meters will create new challenges related to the way the operators make the new energy gains visible and measurable.	*** Relatively new model for both campus operators. New contracts have to be designed and signed between the campus partners and the operators. In addition to the issues mentioned in the ICTO and the IECCO, agreements about the accessibility of the assets and data and the ownership of new generated assets should be agreed.
financial agreements	***** Due to the long experience done with the outsourcing model, campus partners expect to easily adopt the new ICT platform and to switch to the 'ICTO' model.	**** Due to the long experience done with the ESCo model, campus partners expect to easily adopt the new ICT platform and to switch to the 'ICTO' model. However, agreements regarding bonus/malus issues related to activities and services achieved by the new ICT platform should be discussed.	*** New agreements regarding bonus/malus issues related to activities and services achieved by the new ICT platform and related to the improvement of owners assets should be discussed.
complexity to the campus partners	***** As discussed above, this model is perhaps the most easier model to be accepted by the campus partners. However, not all potentials of the ICT platform will be exploited	**** As discussed above, this model may be easily be accepted by the campus partners. However, some of the ICT platform potentials will be not exploited	**** As discussed above, this model may be the hardest model to be accepted by the campus partners. It demands a huge paradigm shift of all campus partners as well as its owner
<p>Summary: the comparison above reveals that the ICTAM model is the hardest to be adopted by the campus partners due to its newness and some unknown risks related to assets accessibility and to the new-to-develop agreements related to bonus and malus issues. Taking into consideration the potentials that may be gained from the ICT platform, the IECCO models seem to be the most suitable model for the two campuses.</p>			

4.4 Findings related to Procurement Schemes

The three suggested business models for the introduction of the integrated ICT platform will be here discussed in relation to some procurement schemes as mentioned in D1.2.

Procurement aspect	ICTO	IECCO	ICTAM
Disjointed contracts	<p>***</p> <p>The ICTO will hardly support the integration of businesses at the campus level and avoid the disjointed contracts.</p>	<p>****</p> <p>The IECCO model can support the integration of disjointed contracts at the campus level. Due to the agreed KPI's agreed in ESCo contracts, campus partners will be forced to follow more integrated procurement schemes to ensure that HVAC systems and other related models are integrated.</p>	<p>*****</p> <p>This model is perhaps the best model in supporting the integration of procurements and contracts. The essence of asset management is to analyse owner' asset from an integrated view of point to ensure higher energy saving gains.</p>
Triple E product Register	<p>**</p> <p>All the three models will suffer from this regulation</p>	<p>**</p> <p>All the three models will suffer from this regulation</p>	<p>**</p> <p>All the three models will suffer from this regulation</p>
Short warranty terms of used products	<p>**</p> <p>All the three models will suffer from the short warranty terms.</p>	<p>**</p> <p>All the three models will suffer from the short warranty terms.</p>	<p>**</p> <p>All the three models will suffer from the short warranty terms.</p>
<p>Summary: the three suggested models score equally on the mentioned aspects. However, the IECCO and the ICTAM are requires more integration in procurement schemes which can help avoiding the risks related to disjointed contracts.</p>			

5. DISCUSSION

D1.2 suggested three ‘existing’ business models supplemented by new ICT features to support the adoption of the integrated ICT platform as developed during the CAMPUS-21 project. The three models have been evaluated in Chapter 4 according to the approach suggested by Osterwalder and Pigneur. The evaluation has been used to compare the three models in order to finish with the most suitable model(s).

Based on the evaluation, the ICTO is most easier model to be applied in the existing demonstration sites. This is due to the familiarity of facility companies and site operators with the outsourcing model. However, the ICTO model is perhaps a model that doesn’t benefit from all potential energy saving gains generated by more integration of services and products as the case in the IECCO and the ICTAM. Less intensive activities/resources, less risks but also less gains.

The IECCO model, conversely to the ICTO, involves more resources (mostly energy related) and apply intensive analysis activities to reach higher level of services for the building owner. This approach requires higher level of integration of both procurement as well as financing.

In addition to the IECCO model, the ICTAM model consider owner assets and work processes in the optimization of whole energy related issue at the campus level. Based on the evaluation in Chapter 4, applying the ICTAM model has the highest potentials to fully benefit from all energy related opportunities at the campus level.

Finally and based on the whole evaluation of the business models we conclude that: The IECCO is the most suitable business model for the purpose of the introducing the integrated ICT platform developed during the CAMPUS-21 project. It provides an attractive balance between benefits from deploying the ICT platform and risks related to HVAC and data analysis. The model also motivates the campus operator to deeply look for further relevant data and put in intensive analytical activities to achieve higher energy efficiency levels.

6. REFERENCES

- Osterwalder, A., & Pigneur, Y. (2013). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. John Wiley & Sons.

