

TIMEPAC Academy

Session 2

Distinguishing Re-Co from Energy Audits and Retrofits

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Our common challenge

- **Reduction of energy consumption** in buildings is a vital element in the long-term transition towards carbon neutral society
- **The house is a machine for living in!** (Charles-Édouard Jeanneret, better known as Le Corbusier)
- It is not dehumanisation, it simply means that the **establishment of performance standards becomes necessary element of modern living**
- ... When you can **measure what you are speaking about, and express it in numbers**, you know something about it ... (Lord Kelvin)
- **Are there universally applicable solutions?**
- **Context of energy use!** It is not possible to expect successful implementation of the initially defined energy efficiency programs without the proper understanding of the implementation environment

Energy audit (1/2)

- Energy audit, almost universally, **aims at identifying opportunities to reduce energy and water consumption**
- It is a **systematic inspection and analysis of energy use and energy consumption** of a site, building, system or organisation with the objective of identifying energy flows and the potential for energy efficiency improvements and reporting them
- It starts from **understanding processes at the level of a building as whole** and recognizing issues that are relevant for energy and water consumption
- Main findings of energy audit are **energy efficiency measures grouped in energy retrofitting action plans** where each retrofitting proposal is evaluated in terms of investment cost and energy savings

Energy audit (2/2)

- Energy audit is a **dynamic category** (new EED)
- Relevant standards (ISO 50002 or EN 16247): **Auditor must estimate future energy use and consumption**
- Comprehensive energy audits require creation of different models and use of innovative tools such as **Building Energy Models (BEMs)** and **Building Information Modelling (BIM)**
- **Energy audit typically ends with recommendations - doesn't involve support for actual implementation**

Re-Commissioning

- Re-Co activities are focusing primarily on **identifying low-cost energy efficiency measures** and **providing support for their implementation to improve building's energy performance**
- The **inspection of the on-site metering system** - direct link between Re-Co and energy auditing
- Re-Co often includes the **implementation of ongoing monitoring strategies** to ensure that systems continue to operate efficiently over time
- **Improvements needs to be measured and verified** - essential element of Re-Co

Energy Performance Certification

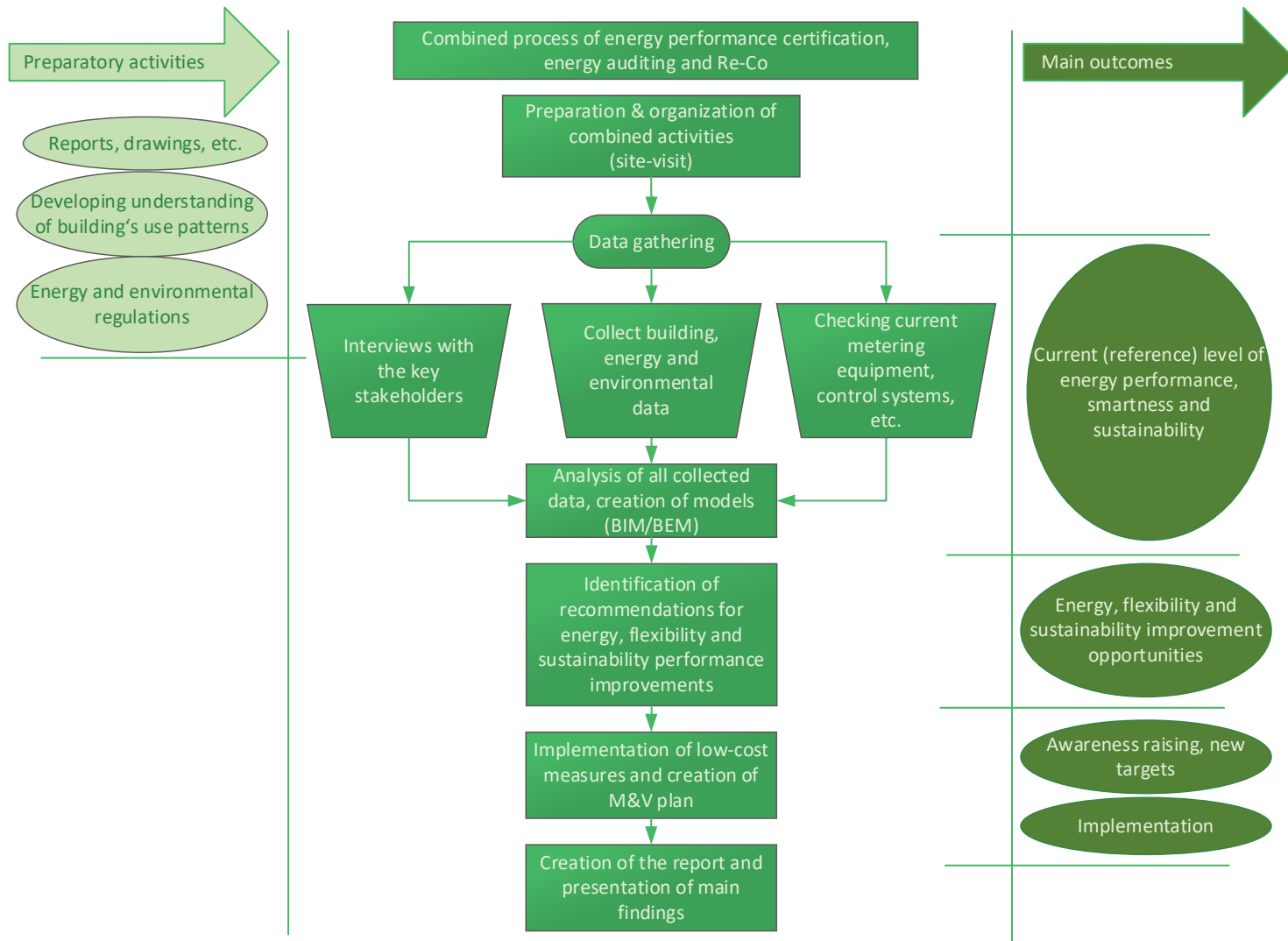
- The EU has identified **buildings as being the most promising target for improving energy efficiency** - a significant energy-saving potential associated with infrastructure and equipment investments
- **EPC has been developed as a key policy instrument to improve energy efficiency, decrease energy consumption and provide more transparency on energy use in buildings**
- There is **a challenge to link EPC data with governmental financial support programs**, training for building managers and tailor-made information campaigns for building users
- Operational point of view - it is crucial **to properly present EPC data to ordinary people** which in many cases do not understand differences between calculated and measured energy consumption

EPC vs Energy Auditing vs Re-Commissioning

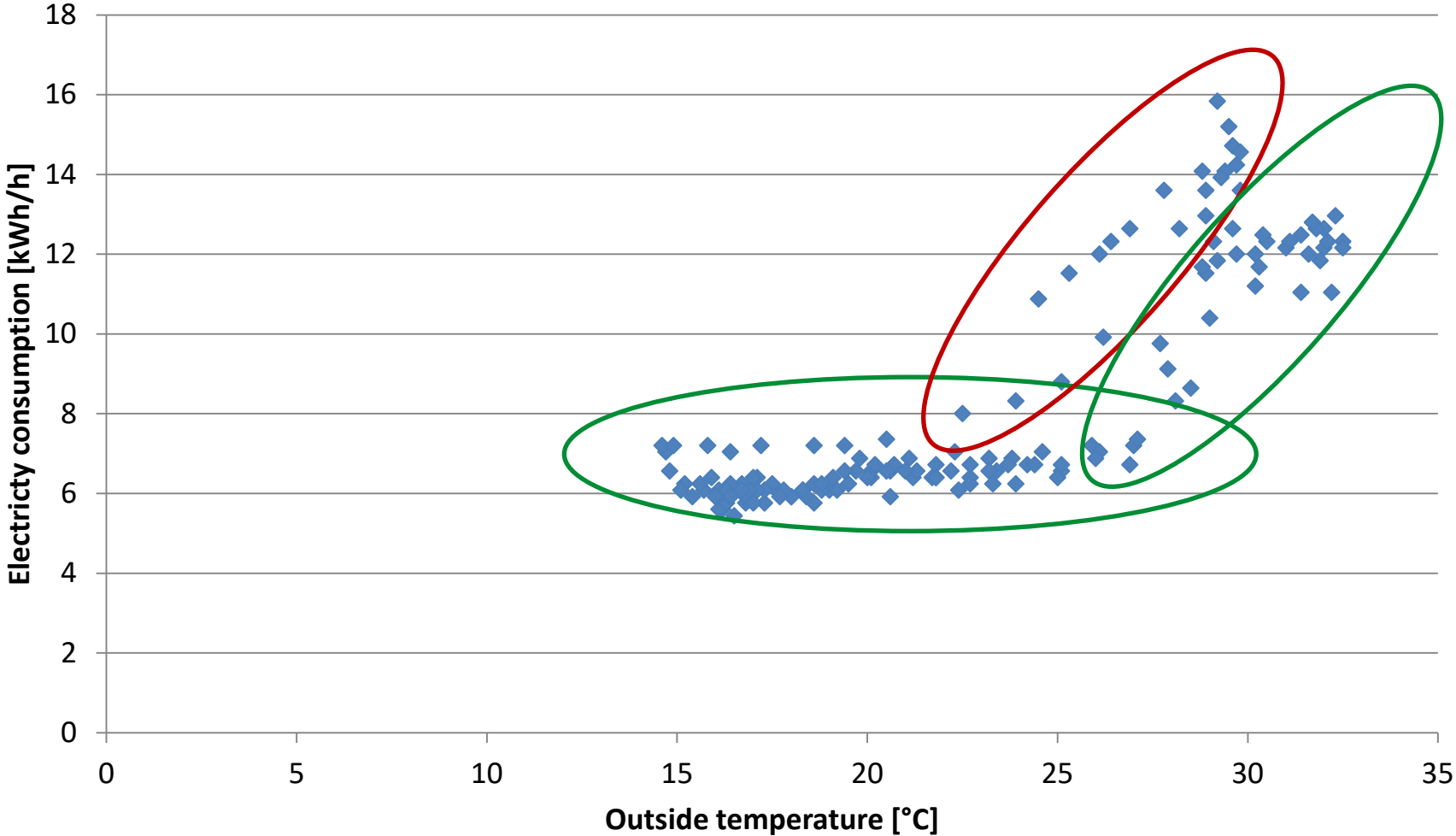
- All three processes contribute to the overall goal of **reducing energy consumption, cutting costs, and minimizing environmental impact**
- Each process plays a different role in this overarching aim: **energy audits identify opportunities, re-commissioning implements improvements, and energy performance certification recognizes and incentivizes achieving energy efficiency targets**
- What do they have in common besides common goal of improving energy efficiency?

On-Site Visit

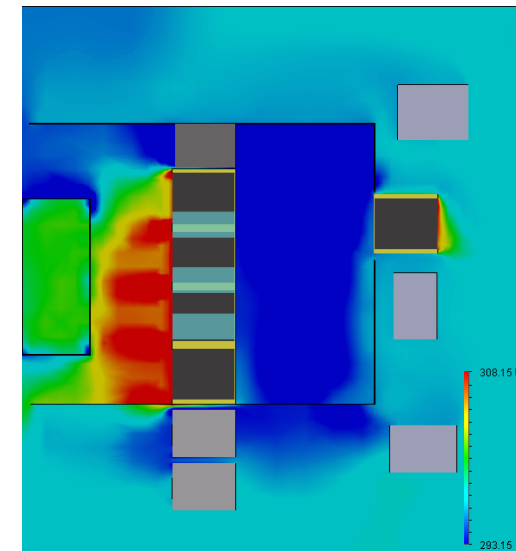
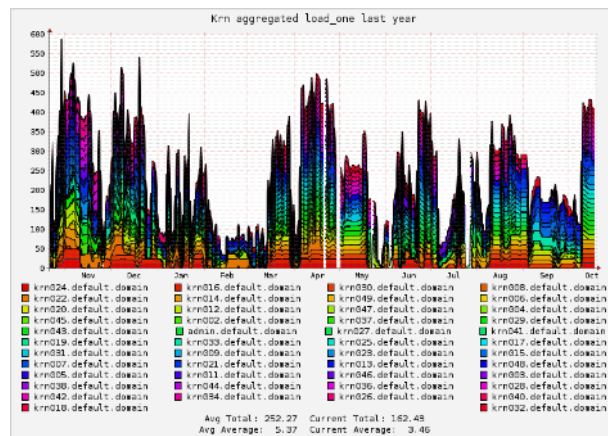
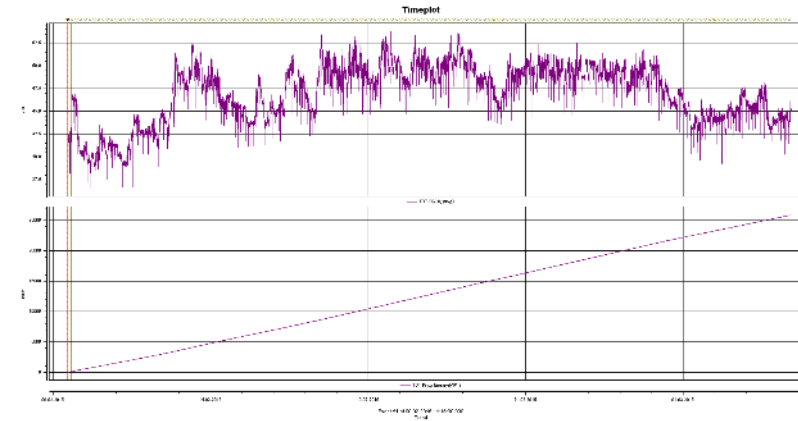
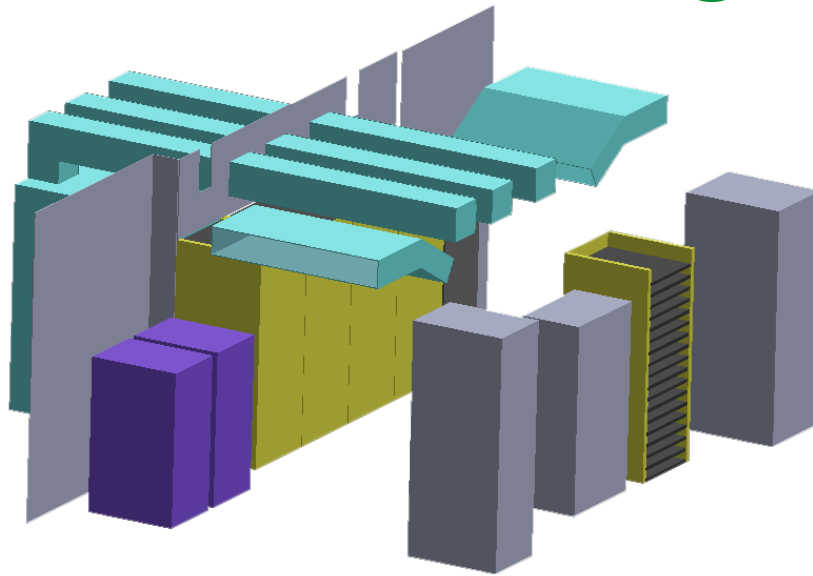
Combining activities



Understanding data patterns



Implementation approach – complex performance evaluation and modelling (1/2)



Implementation approach – complex performance evaluation and modelling (2/2)

- Blending air (hot and cold) - resolved (ensured appropriate airflow volume to ICT equipment)
- Unused servers - resolved
- Energy management system for data centre (including measuring, monitoring and management)

Potential reduction in electricity consumption (MWh/year)	82.3
Indirect (electricity induced) CO₂ emission reduction (t CO₂ / year)	42.2
Cost reduction (€ / year)	6,200
Payback period (static) (year)	2.2
Net present value (€) (economic lifetime 5 years and discount rate 10%)	9,900
Internal Rate of Return (%)	36

Implementation approach – complex building, advanced monitoring and targeting

Staff motivation campaign!
Hospital, Slovenia, 2014
results -5%!

Actual consumption
(verified)

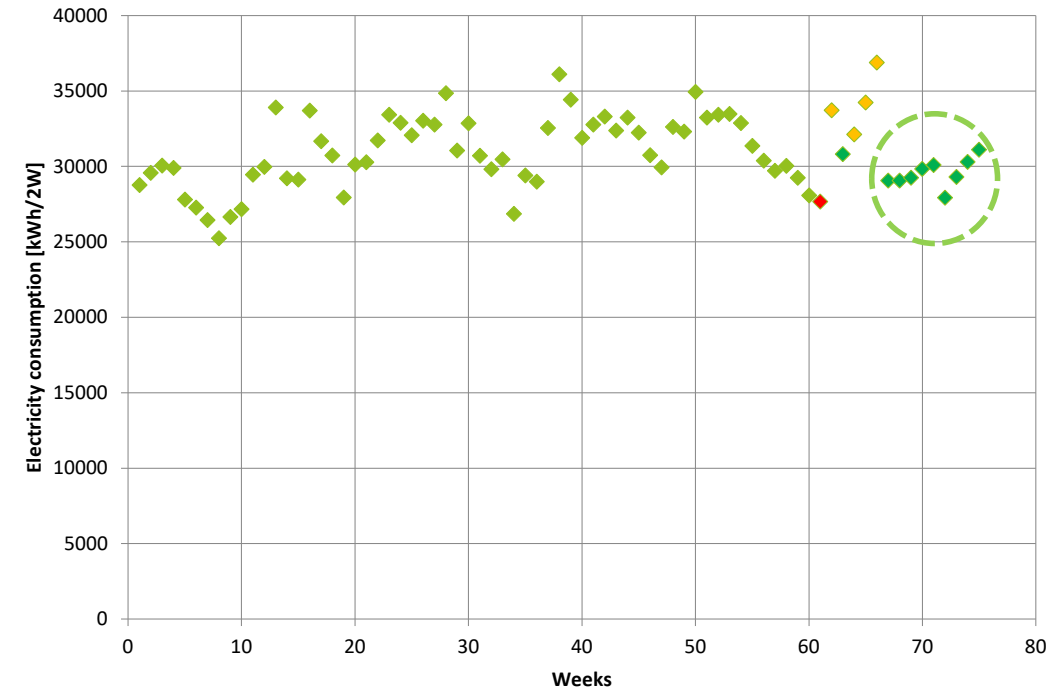
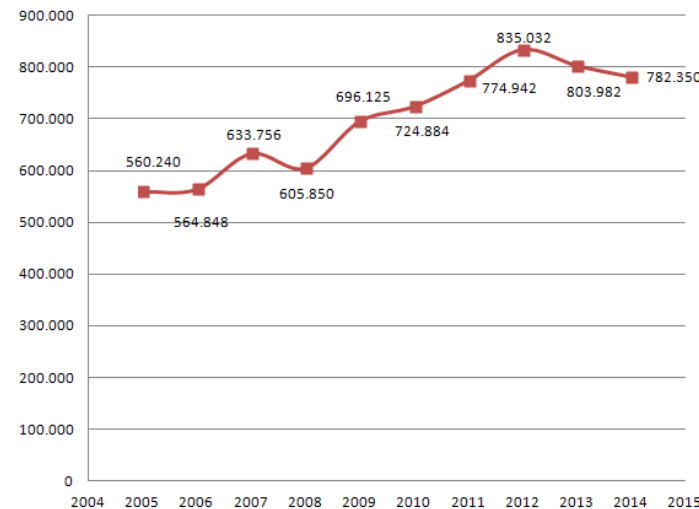
[kWh/14 days]

29.058
29.249
29.826
30.076
27.913
29.293
30.283
31.098

Predicted consumption
(target)

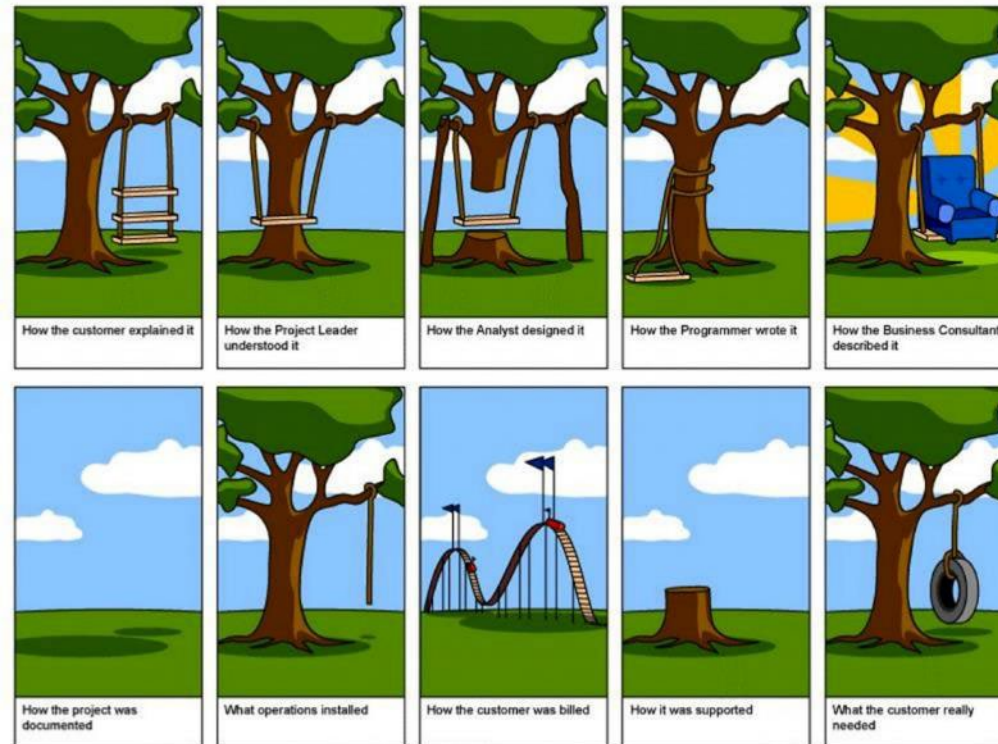
[kWh/14 days]

30.754
30.571
30.637
29.201
28.442
30.988
30.693
30.193



Instead of conclusion – keep the common sense

- Combine activities but never forget your initial goals and expectations from the client!



Source: Watts, A. (2014). *Project Management*. Victoria, B.C.: BCcampus. Retrieved from <https://opentextbc.ca/projectmanagement/> and Watt, A., Barron, M., and Barron, A. (2014). *Project Initiation in Project Management*. Victoria, B.C.: BCcampus [online] Available at: <https://opentextbc.ca/projectmanagement/chapter/chapter-7-project-initiation-project-management/> [Accessed 19 March 2024]

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Thanks for your attention!