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PRODUCTIVE ORGANISATIONAL ENERGY IN THE COMPANY X

Master's thesis

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I have written this master's thesis independently. All viewpoints of other authors, literary sources, and data from elsewhere used for writing this paper have been referenced.

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Abstract

In this thesis as an aim the author will compare productive organizational energy (POE) dimensions in teams of different departments at the energy sector company X. In the face of the challenges of rapid technological development, geopolitical crises, and economic instability, it is crucial for a company to maintain its collective energy level using affective, cognitive and behavioral resources of employees. A validated 14-item questionnaire by Cole et al. (2012) was used to measure these POE dimensions. Through a robust methodology involving a cross-sectional survey of 88 employees at company X across 7 departments, the study revealed consistent organizational energy profiles across teams regardless of employee tenure along two POE dimensions while behavioral energy appeared to be different from the others in terms of tenure. A post hoc interview was conducted with the managers of Company X to discuss the findings and possible factors contributing to the levels of POE dimensions. The findings make an empirical contribution to the evolving field of POE, offering a benchmark for similar companies for comparing POE dimensions across different teams. The study lays the groundwork for future research on longitudinal trends and interventions aimed at improving specific POE dimensions.

Keywords: productive organizational energy, energy, energy sector organization, affective energy, cognitive energy, behavioral energy

Introduction

The modern world faces various challenges associated with rapid technological development, globalization, market segmentation, changing customer needs and unpredictable global events such as the COVID-19 pandemic or geopolitical crises such as the Russian invasion of Ukraine. These challenges are creating an uncertain and unpredictable market environment, forcing companies to innovate, implement new ideas smartly, and adapt quickly to new methodologies (Sherehiy & Karwowski, 2014). Thus, it is very important to be able to anticipate and manage the effects of such changes, which indicates the ability of organizations to absorb and use knowledge from the environment, as well as communicate it inside the organization (Alexiou et al., 2019). Moreover, there are various factors that need to be used in the strategy at certain times, and in certain situations in order to maintain the stability, viability, and development of the company, while identifying the factors and components that contribute to the survival and development of a company is not only a challenge but also an ongoing task that is an integral part of its operating strategy (Borowik, 2013). One of the aspects supporting it is the energy of employees, which drives motivation, enhances collaboration, fosters knowledge sharing and creativity, and gives organizations a competitive edge (Derman et al., 2011). Energy helps organizations to improve cooperation and coordination between departments, and increase employee commitment (Cole et al., 2005). However, according to Cole et al. (2005, 2012) energy in organizations occurs rather at the collective level than at the individual since there is an interaction between the emotional, cognitive, and behavioral resources of group members and therefore, often called in literature as Productive organizational energy (POE), which under different conditions creates a unique measure of organizational effectiveness (Alexiou et al., 2019). POE is defined as “joint experience and demonstration of positive affect, cognitive activation and agentic behavior among members of a collective in their shared pursuit of organizationally salient objectives” (Cole et al., 2005, p. 9).

There has been a lot of research on studying different organizational concepts, for example, organizational behavior, culture, leadership, etc. However, the concept of productive organizational energy is a relatively new and evolving field, therefore there is much more that can be studied. Very few studies were made on measuring productive energy (Cole et al., 2005; Cole et al., 2012; Cuff and Barkhuizen, 2014; Derman et al., 2011), understanding it (Borowik, 2013), identifying patterns (Vogel et al., 2022) and how it is correlated with other factors (Alexiou et al., 2019; Vogel, 2017). Those studies were done in

specific sectors like production, trade, finance, and service, based on specific countries like Germany (Schudy & Bruch, 2010; Walter & Bruch, 2010; Kipfelsberger et al., 2019), Netherlands (Alexiou et al., 2019), South Africa (Grobler & Grobler, 2021; Derman et al., 2011; Cuff & Barkhuizen, 2014), US (Cole et al., 2012), Austria, Liechtenstein, and the United Kingdom (Kunze & Bruch, 2010; Cole et al., 2005), and specific company's sizes - mostly small and medium-sized organizations (Schudy & Bruch, 2010; Walter & Bruch, 2010), large community of firms (Alexiou et al., 2019), private organizations (Grobler & Grobler, 2021), financial institutions (Derman et al., 2011) and multinational organizations (Kunze & Bruch, 2010; Cole et al., 2005).

There have been no scientific studies on the topic of comparing POE dimensions in Estonia, except for the study by Iljuschenkov (2022) on the manifestations of POE in the context of team sports, in particular football. Nevertheless, there is a notable gap in the scientific literature related to the comparative analysis of POE dimensions specifically in companies. The author also didn't find any research done in the company that works in the energy sector. The energy sector plays a crucial role in various aspects of modern society and the global economy (Gorzeń-Mitka & Wieczorek-Kosmala, 2023), both in Estonia and around the world. However, it faces various threats, such as environmental issues, cyberattacks, geopolitical tensions, and, consequently, economic factors. Especially with the recent geopolitical concerns caused by Russian aggression, energy independence is a key issue for Estonia, given the historical development of the energy sector and dependence on Russian energy resources (Khorishko, et al., 2023). For example, energy prices in August 2022 were at the highest point for the last 5 years and in September 2023 the prices increased by 42% compared to May 2023 (Statista, 2023). Thus, these instabilities have a significant impact on the ability of employees to remain committed, goal-oriented, and motivated, as well as to maintain organizational energy at a high level.

Most importantly, the aforementioned studies looked at the organization as a whole, not at specific departments, and did not compare why certain teams have more productive organizational energy than others. In addition to this, there are three different dimensions of POE - affective, cognitive, and behavioral (Schudy & Bruch, 2010). So far, research has mainly looked at the aggregate value of POE and there is none on what dimension plays a significant role in POE differences in global energy companies. Thus, this study will cover a research gap on the topic of comparing dimensions of POEs across teams in a particular department at the global electric power and technologies company X specifically the Estonian branch.

As an aim of this study, the author will compare POE dimensions in teams of different departments at the company X using the 14-item PEM (Cole et al., 2012) survey.

Such company as X has a strong and complex organizational structure, operates on a multinational level, has a long history, different units, branches, and operations, developed innovation strategy, and a large number of employees, is also affected by constant changes and crises in the business environment, e.g. carve out from Y company in 2020, Covid-19 pandemic crisis, economic challenges, etc. Thus, the author considers a particular company as a good research subject for the current study.

By achieving the aim of this study, the author will be able to see in which POE dimension the organization achieves the highest level of energy, and in which dimension the branch is lagging behind. Moreover, we can see if there is a significant difference of POE dimensions between teams. Hence, the study can be useful for the company itself. Last but not least, this research can find its practical application in studies of other companies with the same operating profile and organizational design.

To achieve the purpose of the study, the author analyzed various empirical studies on the measurement of POE and identified the 14-item productive energy measure (PEM) of Cole et al. (2012) as the most widely applicable and reliable. The study included a cross-sectional survey with 88 employees from 7 teams at Company X. Using SPSS Statistics (SPSS, 2023) were obtained final results that revealed the reliability of the measurement tool, the highest rated cognitive and behavioral energy levels and the lowest rated affective energy, and eventually, no significant differences in POE dimensions across teams, but a significant difference in behavioral energy across employee tenure groups. After the results were collected and analyzed the author has also made a post hoc interview with company X managers presenting the results and discussing what are the reasons for obtained POE dimensions' levels.

The thesis is structured in four parts: literature review and empirical methodology, analysis of results, and discussion with conclusion. In literature review, the author presents an overview of energy and POE, its terminology, and dimensions. The empirical part will follow with a description of the methods applied in previous studies as well as in this one, the statistical measurement tool, and the description of the sample with an overview on researched company. The study concludes with a reflection on the obtained results, which will show whether there is a difference in the level of dimensions in some teams at the company X and the highlights of post hoc interview with company managers. In the end, the author concludes with discussion on the topic and give recommendations for practical

implementations for the researched company or others, limitations of current research, and suggestions for future studies in the field.

1. Literature review

1.1. Definitions of POE

In the context of the study, this subchapter delves into the various interpretations of POE conceptual framework and describes terminological subtleties that underpin the understanding of POE.

Foremost, it is important to understand what productive organizational energy as a concept is. Various studies show that energy can be viewed in different ways, ranging from physical viability to psychological enthusiasm and emotional resilience. In the context of organizations, this diversity of perspectives on energy highlights the complexity of the POE concept. While some interpretations focus on time periods (Cole et al., 2012; Vogel et al., 2022), and tangible aspects of individual performance and productivity (Cuff & Barkhuizen, 2014; Derman et al., 2011; Grobler & Grobler, 2021; Schiuma et al., 2007), others emphasize intangible elements such as employee engagement, creativity, and teamwork (e.g. Kunze & Bruch, 2010; Kipfelsberger et al., 2019). For understanding the concept of POE, there are two main definitions that need to be outlined. Firstly, what is energy in the context of company performance, and finally what is defined by productive organizational energy. There are certainly many descriptions of POE in the available literature, as the popularity of this topic grows over time. Thus, this paper presents and discusses the overview on POE as a concept, the basic definitions of POE and, finally, the author gives her own interpretation based on all previously stated.

Firstly, it is important to look at the terminology of “energy” as a whole and in the organization. Energy in general mostly defined in the Oxford English Dictionary as “the ability or capacity to produce an effect”. This term can be interpreted differently in various fields like physics, biology, and social sciences. Similarly, Science Learning Hub – Pokapū Akoranga Pūtaiao (2014) defines energy as “the ability to do work”, which explains a bit more about its definition in a working organization. Thus, we can also say that energy is the power to perform physical, mental, or emotional actions (Schiuma et al., 2007). Although these definitions generally characterize energy as a physical phenomenon, they also provide a potent analogy for the definition of the POE concept. And still, it is imperative to understand the whole POE and its construct. Therefore, the author has designed Table 1 in order to have

a complete picture of some proposed interpretations of the “productive organizational energy” concept.

Table 1

Definitions of Productive Organizational Energy

Author(s), year	Findings/Notion
Borowik, 2013, p. 18	“a joint collective experience of positive emotional arousal, cognitive activation and behavioral efforts to achieve common goals of the staff, and the endeavor to reach the targets of the organization.”
Cole et al., 2005, p. 2	“the force with which a company works”, “a multidimensional construct which consists of an emotional, cognitive, and behavioral dimension”
Cole et al., 2012, p. 447	“the shared experience and demonstration of positive affect, cognitive arousal, and agentic behavior among unit members in their joint pursuit of organizationally salient objectives “

Source: compiled by the author, based on sources in the table

Based on the above-mentioned interpretations, we see that all have comparatively similar meanings and keywords such as “joint collective experience” (Borowik, 2013, p. 18) or “shared experience” (Cole et al., 2012, p. 447). Many scholars distinguish collective and individual human energy in organizations. However, according to Cole et al. (2012) and Vogel (2017) energy at the individual level and energy at the collective level share some features but are different in structure. When analyzing productive organizational energy, we should view it as collective energy rather than individual in the organization since individual-level energy manifests at the intrapersonal level through biological and psychological processes, while productive energy manifests as a collective temporal emergent state that occurs through mutual dependence and inter-individual interactions (Cole et al., 2012; Vogel, 2017). Thus, this study views productive organizational energy as a collective-level energy.

In another study conducted by Vogel et al. (2022) emphasized that POE is quite fluctuating, as it changes depending on different events and periods, so it is important to consider the model through the lens of time. Therefore, the authors presented a structure of POE configurations and trajectories to better identify and predict POE fluctuations and patterns in a retrospective, real-time, and prospective timeframe. Also, it was recommended to use the Organizational Energy survey (Cole et al., 2012) for regular measurement of POE.

However, due to the time limit and the lack of POE data for several years prior to the study, this study will be consented to measure POE dimensions at the present point in time.

It is important to mention that POE is seen as a collective, holistic, and volatile over time periods synergy of people's emotions, cognitive abilities, and goal orientation (Vogel et al., 2022). On the other hand, Schiuma et al. (2007) describe organizational energy as the sum of the energies of all employees, the social networks created within and between teams, and the synergistic integration and combination of all other forms of energy. Cole et al. (2012) noted that the constructs of productive organizational energy are collective motivation, effectiveness, cohesion, autonomy, and exhaustion. Vogel (2017) believes that there are four states of organizational energy, which appear in two parameters - intensity and quality: productive energy, comfortable energy, resigned inertia, and corrosive energy. Bruch and Ghoshal (2003) described the same concept as well, however, the terms they named these stages are a bit different from Vogel's (2017) - aggression zone, passion zone, resignation zone, and comfort zone. In the current research, we are specifically looking at productive organizational energy since there is more probability for a company to succeed in a productive energy state (Bruch & Ghoshal, 2003).

All in all, based on all before mentioned interpretation of the nature of POE we can define **productive organizational energy** as the shared collective experience force of employees consisting of emotional, cognitive, and behavioral dimensions that help to achieve organizationally meaningful common goals in the company.

This chapter examined the conceptual framework of productive organizational energy (POE), its various interpretations and terminologies. The chapter defines "energy" in various fields and lays the foundation for understanding it in an organizational context. Key findings highlight the commonality of definitions of POE, seen as the collective synergy of effort and expertise in organizations, which includes different dimensions ranging from tangible aspects such as individual performance to intangible elements such as employee engagement towards common goals.

1.2. POE dimensions

This chapter describes the multidimensional nature of productive organizational energy (POE), and the convergence of scholars' views on three dimensions: affective, cognitive, and behavioral energy. The author adopts this framework by presenting an overview and definitions of each of the dimensions and provides a visual representation of the three dimensions of POE for better understanding.

Most of the scholars agreed on the multidimensional feature of POE, Vogel et al. (2022), Alexiou et al. (2019), Cuff and Barkhuizen, (2014), Cole et al. (2012), Kunze and Bruch (2010), and Schudy and Bruch (2010) mentioned in their studies that the productive organizational energy construct consists of three dimensions: affective energy, cognitive energy, and behavioral energy. Since the concept of these three dimensions is the most frequently used in previous studies, the author considers it necessary to adopt it in this study as well. To get a closer look at each of these dimensions the author created a Table 2 to visually represent the meaning behind each of the dimensions.

Table 2

Definitions of Productive Organizational Energy Dimensions

Dimension	Findings/Notion by:	
	Schudy and Bruch (2010)	Cole et al. (2012)
Affective energy	"Collective positive emotions, enthusiasm and inspiration toward work-related tasks and the organization's goals."	"members' shared experience of positive feelings and emotional arousal due to their enthusiastic assessments of work-related issues"
Cognitive energy	"Collective ability to think productively and proactively about activities and solutions regarding the work."	"Shared intellectual processes that propel members to think constructively and persist in search of solutions to work-related problems, including the mental faculties to focus attention, shut out distractions, and have a desire to make "good things" happen"
Behavioral energy	"Collective agentic behavior towards the organization's common goals"	"Encompasses the pace, intensity, and volume with which members purposefully invest physical resources"

Source: compiled by the author, based on sources in the table

From the Table 2 we can see that both sets of definitions consistently emphasize the collective nature of affective, cognitive, and behavioral energy. Both authors underline positive emotions, constructive thinking, proactivity, and purposeful action toward common goals. However, Schudy and Bruch's (2010) definitions are concise and straightforward, emphasizing emotional inspiration in affective energy, problem-solving ability in cognitive energy, and agentic behavior in behavioral energy. Whereas Cole et al. (2012), while

converging on these aspects, provide more detail, including specific mental abilities in cognitive dimension and tangible practical elements like pacing and investment of physical resources in behavioral dimension. Ultimately, while both Schudy and Bruch (2010) and Cole et al. (2012) agree on the core dimensions of POE, and provides a good understanding about each dimension, still a more precise look at each one is required.

Affective, or emotional energy as Cole et al. (2005, 2012) refers to it, is an emotional response to a particular type of event or interaction with the environment as a result of a positive evaluation related to needs, goals or work situation expressed through feelings of inspiration, enthusiasm, and attentiveness to work tasks and organizational priorities (Cuff & Barkhuizen, 2014). Walter and Bruch (2010) and Grobler and Grobler (2021) argue that transformational leaders, through their charismatic emulation, visionary aspirations, and individual approach, foster emotional attachment and motivational arousal of both individual and group followers and have a positive impact on the emotional energy of the organization. Scholars (Alexiou et al., 2019) also argue that centralized organization can be a roadblock to achieving emotional engagement in organizations, however, the hypothesis testing from Walter and Bruch (2010) resulted in the positive moderating role of centralization to emotional energy. In the study of Kipfelsberger et al. (2019) was confirmed that employees who exhibit high prosocial impact and spread it to others tend to increase the positive emotions as happiness, elevation, inspiration, and enthusiasm in both themselves and others, hence increasing collective affective energy. Schudy and Bruch (2010) argue that there are ways to foster affective energy in the team, for example by using autonomy in decision-making of contributing to the overall goals of the organization, because it evokes strong emotions, or by using work environments that increase emotional energy. For example, Borowik (2013) argues that affective energy is stimulated through interactions between employees which are achieved through events, meetings, and teamwork training as they evoke positive collective emotions among employees. Grobler and Grobler (2021) acknowledge this stating that productive energy can be increased through direct, honest and transparent communication, which can be supplemented by honest, fact-based discussions related to performance. Thus, it can be summarized that affective energy reflects collective positive feelings and emotional arousal among employees related to their work environment (Derman et al., 2011; Grobler & Grobler, 2021).

All processes related to intellectual thinking, finding solutions to work-related problems, and being intellectually active in pursuit of common goals demonstrate collective **cognitive energy** (Grobler & Grobler, 2021; Cuff & Barkhuizen, 2014; Vogel & Bruch,

2011). Schudy and Bruch (2010) again argue that via autonomy in deciding how to allocate one's workflow stimulates cognitive processes. In the same way, Cole et al. (2012) say that cognitive energy is stimulated through a shared understanding of employees' shared goals and their involvement in identifying trends, strategies, missions, or needs for change in processes for example (Borowik, 2013). Further, highly developed transformational leadership increases creativity, critical-independent thinking, innovation, understanding of shared vision, purpose, and expectations among followers (Walter & Bruch, 2010; Grobler & Grobler, 2021). Employees with high prosocial impact effectively use information for strategic decisions, showing more creativity and cognitive flexibility to achieve collective goals (Kipfelsberger et al., 2019), thus enhancing cognitive energy.

Behavioral energy represents the degree and intensity of actions that groups invest to contribute to the implementation of organizational goals (Cuff & Barkhuizen, 2014; Vogel & Bruch, 2011; Cole et al., 2012). In other words, "behavioral energy is an investment of resources (in terms of pace, intensity, and volume) intended for organizational development" (Grobler and Grobler, 2021, p. 24). It is worth noting that the behavior of people varies greatly even among those who work closely in the same team and the behavior of employees very often depends on the leader or key figures who inspire, guide, engage and show organizational culture, set the model and example of work efficiency (Borowik, 2013; Grobler & Grobler, 2021). Walter and Bruch (2010) also confirm that leader emulation, particularly role modeling and visioning, encourages employees to exert effort and be proactive to realize the relevant goals, and reinforce their efforts and performance. Moreover, they also found that bureaucratic, formalized organizations have higher behavioral energy (Alexiou et al., 2019; Walter & Bruch, 2010). In fact, when employees realize that their efforts can produce personally meaningful results, they are more motivated to achieve results and work harder to maintain prosocial influence through their work (Kipfelsberger et al., 2019).

For a better understanding of these three POE dimensions, the author provides a visual representation of these dimensions and their short meanings (Figure 1).

Therefore, we can observe that there are factors affecting more than one POE dimension or affecting all three directly or implicitly, e.g. transformational leadership that positively influences diversity in the company, age lines, considering seniority and gender, creates an integrative social identity for all team members, overcomes the negative dynamics of emotional conflicts due to different social identities, and thus increases the overall level of POE dimensions (Kunze & Bruch, 2010). On the other side, there are factors that cause POE

dimensions deterioration, for example, discrimination and self-segregation that leads to emotional conflicts in the teams by focusing more on interpersonal disagreements or other non-work issues, and thus, the difficulty of collective thinking and acting productively on a problem to achieve common goals (Kunze & Bruch, 2010). Worth mentioning that none of the three POE dimensions depend on the company's size, although in large, more complex organizations the distance between leaders and employees is greater, company goals are more complex and rather abstract for understanding, and team leaders may appear to be superficial (Walter & Bruch, 2010).

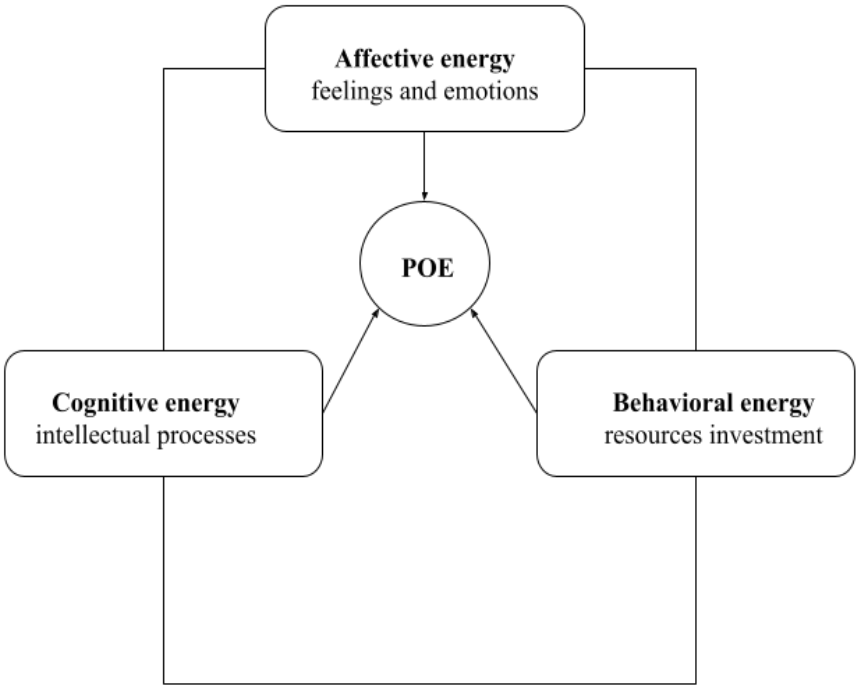

Figure 1

Productive Organizational Energy Dimensions

Source: compiled by the author

In summary, the author examined the multidimensional nature of productive organizational energy (POE). Commonly accepted dimensions of POE are affective energy, cognitive energy, and behavioral energy. The author adopts these particular dimensions for her study, emphasizing their frequent use in previous research. After a detailed comparison of the various definitions for all three dimensions from different papers, the author notes that the main focus is on the collective nature of each of the dimensions. Briefly, affective energy is defined as positive emotional reactions related to work tasks and organizational priorities. Cognitive energy is described as intellectual processes and problem-solving abilities stimulated by autonomy and a shared understanding of company goals and processes.

Behavioral energy represents the intensity of actions to achieve organizational goals, with leadership and organizational culture influencing its change. Also, for better understanding, the author has created a visual representation of the three dimensions of POE.

In the subsequent section, the author will provide a method for measuring POE dimensions as well as an overview on the sample.

2. Methods and sample

To fulfill the objective of the study, the author has chosen a quantitative methodology to evaluate the levels of POE measurements and compare the different teams in the selected company. In addition, the author conducts a post hoc interview. In this section, the author gives an overview of the statistical method and instrument for measuring productive organizational energy used in this research for comparing POE dimensions across different departments in selected research organizations.

In addition, the author will provide a comprehensive overview on the selected sample, which will serve as a basis for further analysis and conclusions of the study.

In order to conduct a comprehensive, concise and compliant empirical study, the author followed the following steps in this chapter:

1. Determine the data collection method and response evaluation criteria to ensure a thorough analysis of POE dimensions.
2. Select the research sample and ascertain their availability to participate in the study.
3. Include items in a suitable instrument to collect responses in different languages preferred by the selected sample.
4. Distribute the questions to the sample - the employees of the company.
5. Collect and analyze the responses using SPSS statistical tool.
6. Evaluate the level of each POE dimension in each team and present the findings.
7. Conduct a post-hoc interview with the Company X representatives.

2.1. Description of the sample

For the current study, the author has selected X organization that operates in the power technologies industry as a research object for the reason that the company has a complex organizational structure operating worldwide, with an extensive history, diverse divisions, branches and operations, as well as cooperates with other branches in different countries, and operates in the volatile Estonian energy sector (Khorishko, et al., 2023), which requires a dynamic approach to adaptation and sustainability in different environments.

The sample for the research is compiled by the employees, team leads, and managers of 7 different teams of Finance, human resources (HR), supply chain management (SCM),

and Business departments in the company X. In order to provide an in-depth understanding of the importance of comparing energy dimensions between selected teams, the author provides an overview of the teams' functioning, their interactions, internal relationships, and contribution to the overall collective energy level in the organization.

Estonian branch of Company X represents departments dealing with common shared services functions such as finance department, supply chain management, human resource operations, business operations, and local management. Although these departments are not tightly integrated, their operations have a significant impact on overall company performance and collective energy. Within each department, teams collaborate closely, which is exemplified in the finance department, where there are three teams divided into several sub-teams in each. Considering the global activities of the company, the Estonian branch serves the countries territorially close to Estonia and has rather functional structure. Each sub-team is responsible for providing services to a specific customer-country, which creates close interconnections between team members from different sub-teams. The team organization model of most departments is based on the processes performed rather than the location of service delivery, except for the business and service department, which are limited to activities in Estonia, and local management, which is focused on the internal processes of the Estonian branch. The author created a Figure 2 to visually present the relations between sub teams on the example of Finance department. HR operations and SCM departments have a similar functional structure, but they may differ in the number of teams, processes, and functions they perform.

Thus, the study focuses on company X in the energy technology industry, chosen because of its global complexity and activities in the Estonian energy sector. The sample consisted of seven teams from finance, HR, SCM and business units due to their functioning, interaction and collective energy contribution. The Estonian branch with shared services demonstrates a functional structure that promotes collaboration between teams.

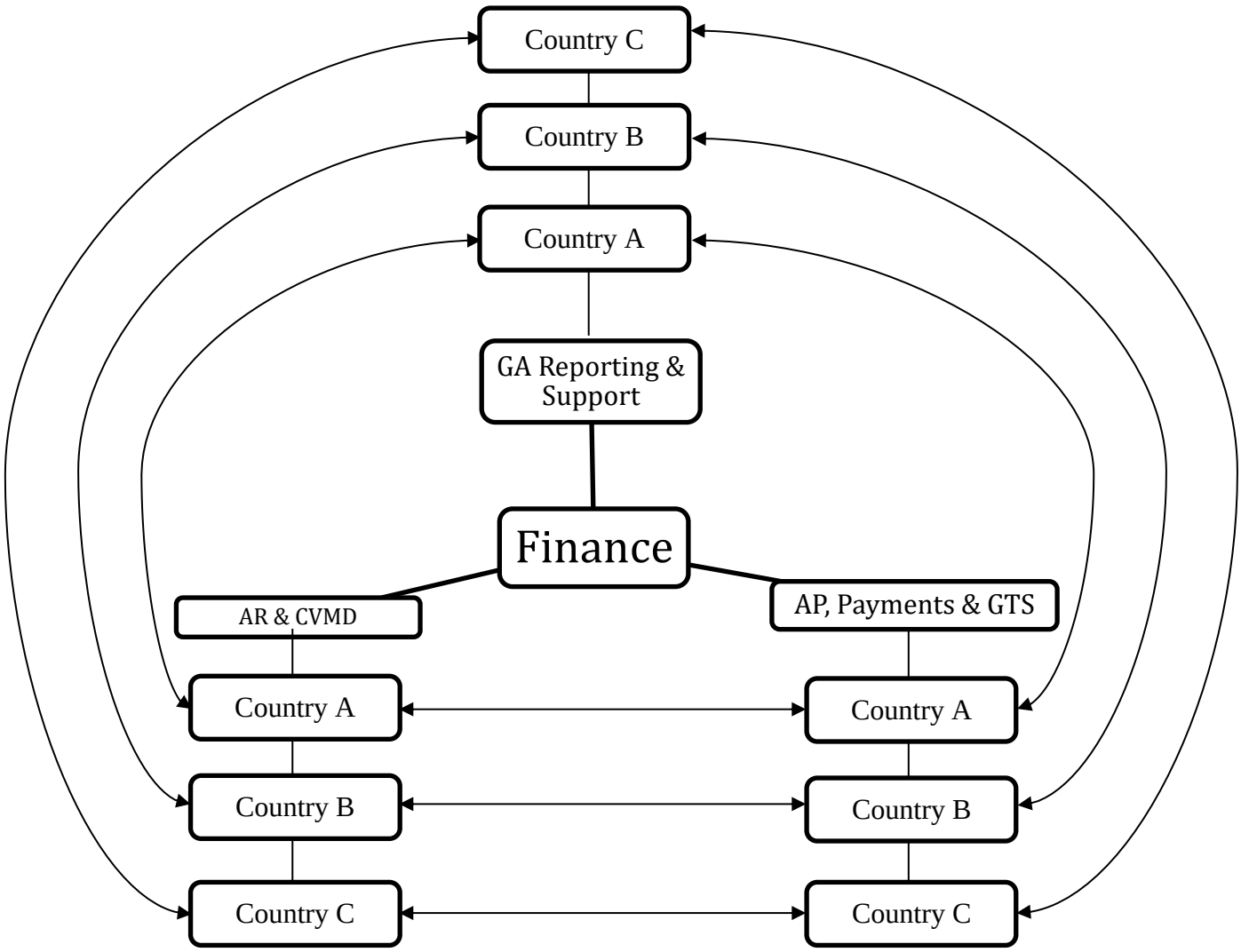

Figure 2

Division of sub-teams' relations in Finance department

Note: AP - Account Payable; GTS - Global Travel Service; AR - Account Receivable; CVMD - Customer Vendor Master Data; GA - General Accounting.

Source: compiled by the author based on Company X organizational structure

2.2.Methodology of POE measurement

This chapter presents the methods for measuring POE and its dimensions employed in available studies. In general, POE is measured using empirical numerical methods, particularly using cross-sectional surveys to collect data on participants' attitudes, opinions, or behaviors at certain points in time. Statistical methods such as exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) are commonly used when incorporating POE to validate and refine the measurement instrument. The 14-item PEM (Cole et al., 2005; 2012), is widely recognized and validated in POE research. The discussed studies apply a

quantitative approach, using statistical analyses and measurement tools to measure and analyze POE dimensions. In line with this established trend, this paper will also utilize a quantitative approach, 14-item PEM by Cole et al. (2005, 2012) and cross-sectional surveys.

To achieve the aim of current study, the author analyzed different tools for measuring the level of POE dimensions (affective, cognitive, and behavioral) in organizations. Therefore, I have considered the research of several authors who worked on the validation of a measure of organizational energy in different contexts (Cole et al., 2005; 2012; Cuff & Barkhuizen, 2014; Derman et al., 2011; Grobler & Grobler, 2021; Kipfelsberger et al., 2019; Kunze & Bruch, 2010). The author has presented a short summary of all these studies in Appendix A for a concise overview, comparison, and analysis of different research methods used and results obtained.

It has been suggested that empirical quantitative measurement of energy is a challenging, if not impossible, task (Vogel et al., 2022). However, the studies made by Cole et al. (2005; 2012) are considered to have developed a reliable validation tool for measuring POE in the organization at a collective level and are widely referenced and regarded by other research endeavors. They proved that POE is a collective construct with 3% of individuals' POE in the study showing affiliation with a particular department or team. Considering that it is imperative to get a closer look at Cole et al.'s (2005; 2012) methodologies for the current study too.

Cole et al. (2005) presented 3 studies in their research. The initial 14-item survey measured various dimensions. However, due to lack of consistency in measuring behavioral energy, two items were added, resulting in the 16-item questionnaire tested in the second study. In the third study, they validated the instrument, confirming that the POE concept is a valid measure of productive energy in organizations. In subsequent work, Cole et al. (2012) presented a measure of productive energy (PEM) supported by four studies showing a positive correlation between PEM and company performance at both work-unit and individual levels in different time periods and proved that POE is indeed constructed by three dimensions. The final 14-item PEM can be found in Appendix B.

Hereafter, Cole et al.'s (2005; 2012) method, specifically PEM 14 items measure, has also been used in further studies by Cuff and Barkhuizen (2014) who were validating PEM in different ethnic groups in South Africa resulting in nonsignificant differences between dimensions, Grobler and Grobler (2021) who used Cole et al. (2012)'s PEM 14 items measure and found that productive energy is influenced by ethical leadership and person-organization fit, as well as Kipfelsberger et al (2019) for validating that customer contact influences

organizational energy through prosocial impact, and finally, Kunze and Bruch (2010) used 14-item scale measure for finding the impact of age difference on the productive energy of teams.

Notably, regardless of the measurement method or scale used, most studies have employed a cross-sectional survey design, i.e., participants are questioned at a specific point in time to collect data on their attitudes, opinions, or behaviors. In line with this principle, the present study will employ the same cross-sectional survey method. This approach allows for collecting valuable data from the participants, giving them the opportunity to analyze and draw conclusions on POE at a particular point in time and achieve the purpose of this study. Therefore, as the author aimed to gather data at a specific point in time at a particular branch of the company, a cross-sectional survey was created and distributed in Microsoft Forms in 3 different languages: English, Estonian, and Russian as these are the main native languages of the employees in this company. The survey was translated into Russian and Estonian with back-and-forth translation in a translation agency back in 2022. The translation has been initiated and paid by Anne Aidla. A template for the English version of the survey form is provided in Appendix C.

For the distribution of the cross-sectional survey, the HUB manager and internal communication manager have been contacted. Each member of the involved organization received an email inviting them to participate in the study, accompanied by a hyperlink to the survey form. Participants were given clear instructions about the confidentiality and anonymity of their participation as well as research aim, explanation on what is POE and benefits for company to measure it. In total, the questionnaire was sent to 207 employees of 7 different teams of Finance, human resources (HR), supply chain management (SCM), and Business departments. The data were collected over two weeks period from 27.10.2023 till 12.11.2023, so that employees would have time for answering the questions at their close availability time.

Considering the characteristic of data collection, cross-sectional survey using Likert scale and collection of numerical responses from participants, as well as the attribute of generalization, objectivity, and ease of data analysis for comparison, the author chose quantitative research method.

At the beginning of the survey, respondents were asked to indicate the sub-team to which they belong, which facilitated a more convenient analysis and comparison of results on different dimensions. Sixteen sub-teams provided by the managers of the surveyed company were offered for choice selection. In addition, a follow-up question was asked about the

respondents' length of work tenure in the organization, and the response options were divided into the following categories: less than 1 year, 1-3 years, 4-6 years, and more than 6 years. Such categorization was necessary to ensure the accuracy of the data, since the company employed trainees who, due to their limited experience and understanding of the specifics of the team's work, could express biased opinions, which could lead to distorted responses. The survey was continued with the main part of questionnaire.

In order to achieve the goal of this study, which entails the comparative analysis POE dimensions across different company teams, the author required a validated instrument to facilitate measurement of each POE dimension. For this purpose, as mentioned earlier, it was decided to use the 14-item measure PEM validated by Cole et al. (2012). The construction of these items was such that for each dimension, separate statements were formulated to define the respective levels. For example, five statements were developed to define affective energy, five for cognitive energy, and four for behavioral energy. Thus, in order to see the level of each of these statements, the author decided to use the Likert scale with a five-point agreement continuum (1 = strongly disagree; 5 = strongly agree). In other studies, researchers have also used the Likert scale for example Vogel et al. (2022) or Alexiou et al. (2019). The author considered it to be a rather appropriate tool to measure the level of each dimension since the Likert scale answering method is easy to understand for respondents, a standardized way to measure perceptions and analyze responses by obtaining trends, and correlations in the collected data (Joshi et al., 2015). The way the questions were presented to the respondents can be found in Appendix C.

Following the collection of responses, the author did the statistical analysis carried out in the SPSS Statistics program (SPSS Inc., 2023). The author performed a comprehensive analysis of the 14-item PEM developed by Cole et al. (2012). This included assessing reliability and validity using Cronbach's Alpha coefficients. Descriptive statistics including means, medians, maximum and minimum values were used to analyze the data. To understand the discrepancy in responses on certain dimensions, the Wilcoxon test was applied. In addition, Spearman's correlation test was used to examine relationships within the data. The Kruskal-Wallis H test was used to compare the means of seven different independent teams across departments. The main goal is to provide a structured overview of each dimension within each team, allowing comparisons to be made across all teams. Therefore, application of a 95% confidence level ($p \leq 0.05$) established the threshold for statistical significance, ensuring the reliability of the results. This multifaceted approach

contributes to a deep understanding of performance measurement across a variety of team contexts.

Moreover, after all responses were collected and analyzed, the author conducted a post hoc interview with the managers of each team in English to present and discuss the results in each team. The company representatives were also informed about the factors that influence the POE dimensions based on studies mentioned earlier. Given this, management personnel were asked the questions to clarify the details of existing initiatives and practices that strengthen and sustain the organization's energy at its current level. In addition, they elaborated on promising activities to increase energy levels.

In conclusion, this chapter outlines methods for measuring Productive Organizational Energy (POE) and its dimensions, predominantly employing empirical numerical techniques like cross-sectional surveys and statistical analyses. Given the high significance and common application of Cole et al.'s (2012) validated method for POE measurement, the author considers it essential to employ this method in the present study for more detailed review, practicability, reliability, and scientific validity. Therefore, a 14-item measure PEM validated by Cole et al. (2012) (Appendix B) will be used in the current quantitative study. The research methodology involves a cross-sectional survey distributed to 207 employees across seven teams in Finance, HR, SCM, and Business departments, utilizing statistical techniques for analysis. Statistical methods, including Cronbach's Alpha coefficients, descriptive statistics, and tests like Wilcoxon, Spearman's correlation, and Kruskal-Wallis, will be applied for a comprehensive analysis of POE dimensions across teams. The study includes a post hoc interview with managers to clarify results and explore initiatives for enhancing organizational energy.

In the next chapter the author presents the results, interprets the findings, and makes a final discussion on the comparison of energy level in different teams of the studied organization.

3. Analysis and results

3.1. Results of quantitative study

This chapter describes the systematic process of converting the survey responses from X employees into conclusions, which allows us to fulfill the aim of this study. Using analytical tools and methodologies, the author has identified the patterns and correlations inherent in the data set, and thus will be able to examine whether there is a difference between the POE dimensions among different teams in the company. In addition, the interpretation of the obtained results were presented to company managers in post hoc

interview and allows us to make reasonable conclusions for the company and recommendations for further research.

In total, the survey has been sent to 207 employers to answer the questions with the help of email distribution, from which 88 answers have been received with a total response rate of 44,5%. 25% answered in English, 22,73 % in Russian and 52,27% in Estonian. Every respondent answered to each question so there were no missing values and complete set of data. Mostly, 38,6% of the participating employees were employed at their company for 1-3 years and 29,5% - less than a year. Figure 3 shows the distribution of respondents' employment years from the company by quantity.

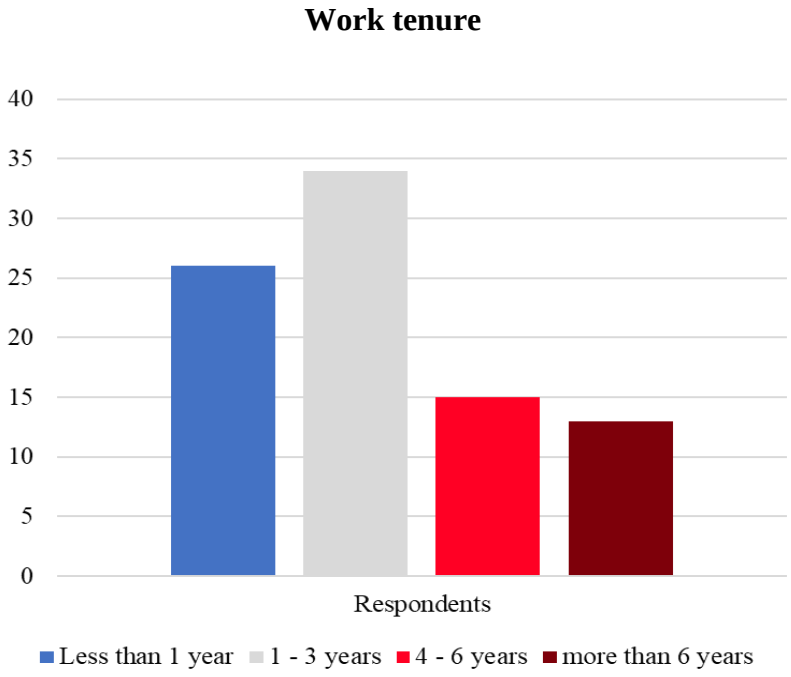

Figure 3

Work tenure of employees

Source: compiled by the author, based on the survey results

In addition, analyzing responses by team showed that the Account Payable (AP), Payments, and Global Travel Service (GTS) teams accounted for the largest number of survey participants, comprising 27% of the total responses. This was followed by the Account Receivable and Customer and Vendor MasterData (AR & CVMD) team at 17%, and the General Accounting (GA) and Common Shared Services Supply Chain Management (CSS SCM) teams contributed for 16% each. This overview is presented in Figure 4.

The SPSS Statistics tool was used to determine follow-up results. To enter data into the program, the author made systematic coding of responses in the following way: 1 = Less

than 1 year, 2 = 1 - 3 years, 3 = 4 - 6 year and 4 = more than 6 years. Similarly, codes for teams: 1 = GA, 2 =AR & CVMD, 3 = AP, Payments & GTS, 4 = CSS SCM, 5 = HR, 6 = Business and 7 = others.

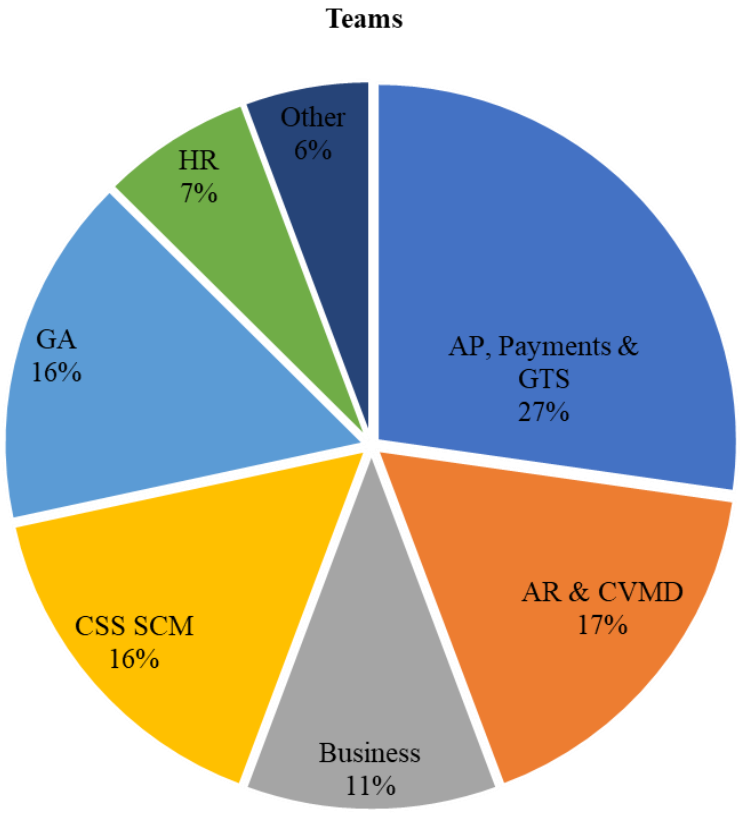

Figure 4

Survey participation by teams

Note: AP - Account Payable; GTS - Global Travel Service; AR - Account Receivable; CVMD - Customer Vendor Master Data; CSS SCM - Common Shared Services Supply Chain Management; GA - General Accounting; HR - Human Resources

Source: compiled by the author, based on the survey results

First of all, the reliability of the results was assessed using Cronbach's alpha coefficient. Our goal was to see if all questions related to each of the three different dimensions could be combined and if these scale questions would more reliably measure each of the POE dimensions. The results of each dimension are visible in Table 3.

Table 3

Cronbach's alpha reliability statistics coefficients

	Affective energy	Cognitive energy	Behavioral energy
Cronbach's Alpha	.91	.70	.77
N of Items	5	5	4

Source: compiled by the author, based on survey results and SPSS Statistics analysis

Generally, a Cronbach's alpha value greater than 0.70 is considered acceptable, and a value greater than 0.90 often indicates high reliability of the scale (George & Mallery, 2003). This can be observed in the case of affective energy. The Cronbach's alpha coefficient here is 0.91, indicating a high level of internal consistency among the five items of the affective energy measurement scale. While values for cognitive energy (0.70) and behavioral (0.76) meets the minimum threshold for reliability however indicate a moderate level of internal consistency among its items in a scale. All in all, we can say that all questions in each dimension show high internal consistency, which means that the items effectively and consistently measure the target construct of the POE and provide a acceptable level of reliability in the capacity to ensure that the ultimate aim of the study will be achieved.

The next, the author conducted a descriptive statistics analysis to present the central tendencies of the responses, variability and distribution of the variables examined. The results are summarized in Table 4. The subsequent procedure involved testing whether there are statistically significant differences between paired observations on dimensions which include cognitive-affective, behavioral-affective, and behavioral-cognitive. The Wilcoxon test was used for this purpose, given the ordinal data type and the limited sample size (88), which made it necessary to use a non-parametric test (see Table 5).

The results showed that the highest average value in the dataset (mean = 3.83) belongs to the cognitive dimension and behavioral dimension (mean = 3.78) and then the affective one (mean = 3.37). It indicates that on average, respondents tend to show higher level of cognitive and behavioral energy compared to affective energy. The medians show that the highest middle value in data set has cognitive energy (4.00). In addition, the bigger standard deviation is shown for the behavioral and affective energy dimensions, 0.79 and 0.78 respectively, indicating a greater variability in employee responses, meaning that each employee has more dispersed opinions about the level of these dimensions. Whereas for the cognitive dimension, respondents largely answered in the alike pattern, as demonstrated by the smaller standard deviation of 0.64. Hence, based on these results we can hastily conclude

that respondents assigned the highest rating to the cognitive and behavioral energy levels and the lowest to the affective energy level.

Table 4

Descriptive statistics

	Affective	Cognitive	Behavioral
Mean	3.37	3.83	3.78
Median	3.40	4.00	3.75
Std. Deviation	.78	.64	.79
Minimum	1.00	1.80	1.00
Maximum	4.80	5.00	5.00

N = 88, Missing = 0

Source: compiled by the author, based on survey results and SPSS Statistics analysis

Table 5

Wilcoxon test

	Cognitive - Affective	Behavioral - Affective	Behavioral - Cognitive
Z	-5.37b	-3.91b	-.59c
Asymp. Sig. (2-tailed)	<,001	<,001	.554

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.
c. Based on positive ranks.

Source: compiled by the author, based on survey results and SPSS Statistics analysis

However, to fulfill the aim of this study, which is to investigate and compare POE dimensions in different teams of X, the author conducted the Kruskal-Wallis H-test. Given the need to compare the mean values of data across seven different teams, each of which is treated as an independent sample, and given the relatively small sample size, the Kruskal-Wallis H test proved to be an appropriate analytical choice (see Table 6 and Table 7). It should be emphasized that when comparing POE across teams, first of all, the author decided to combine all dimensions within each team. This approach is due to the uneven distribution of responses from individual teams, for example, the HR team provided only 6 responses. In addition, the lack of significant differences in medians and means between dimensions, as shown in the descriptive statistics, further justifies combining the dimensions within each team for a comprehensive evaluation. Upon receiving the results, the author obtained a p-

value equal to 0,52 indicating no significant difference in the distribution of the variable between the teams (Table 6). Thus, all teams work with almost the same level of POE with no significant difference. Second, Table 7 illustrates the difference in results on the dimensions between the teams. Thus, the p-values show that there is no significant difference between the teams on the affective (p = 0.52), behavioral (p = 0.46) and on the cognitive dimensions (p = 0.18).

Table 6

Independent-Samples Kruskal-Wallis Test Summary by teams

Total N	88
Test Statistic	5.2[a]
Degree Of Freedom	6
Asymptotic Sig. (2-sided test)	.52

a. The test statistic is adjusted for ties.

Source: compiled by the author, based on survey results and SPSS Statistics analysis

Table 7

Summary of Kruskal-Wallis test by dimensions and by teams

	Affective	Cognitive	Behavioral
Kruskal-Wallis H	5.2	8.83	5.69
Asymptotic Sig.	.52	.18	.46

Degree Of Freedom = 6

Source: compiled by the author, based on survey results and SPSS Statistics analysis

In addition, the author was interested if there is any influence of the respondent's length of time worked in the company since newcomers may have a limited familiarity with the company's work style in teams and give a biased opinion on the POE levels. Therefore, another test was conducted to see if there were differences in energy levels depending on the number of years employees work in the company. Using the Kruskal-Wallis test for this analysis yielded a p value of 0.154, showing that there is not enough statistical evidence of significant differences in the distribution of the variable across different work tenure categories (Table 8). However, if we consider whether there is a difference between work tenure groups on each dimension separately, we can see that there is no significant difference on the affective (p = 0.15) and cognitive (p = 0.11) dimensions, while there is a significant difference on the behavioral dimension (p = 0.02) (see Table 9). This indicates that long-term employees and those who recently joined the company perceive behavioral energy

differently. The author calculated the average answers for behavioral energy in different tenure groups. Employees with less than 1 year work experience at company X rated behavioral energy at the highest level - 3.31 on average. A bit lower rating was given by those who work more than 6 years (3.09), and the lowest rating was given by those who work 1 - 3 years and 4 - 6 years (2.87 and 2.80 respectively).

Table 8

Independent-Samples Kruskal-Wallis Test Summary by work tenure

Total N	88
Test Statistic	5.254[a]
Degree Of Freedom	3
Asymptotic Sig. (2-sided test)	.154

a. The test statistic is adjusted for ties.

Source: compiled by the author, based on survey results and SPSS Statistics analysis

Table 9

Summary of the Kruskal-Wallis test by dimensions and by work tenure

	Affective	Cognitive	Behavioral
Kruskal-Wallis H	5.25	6.08	9.46
Asymptotic Sig.	.15	.11	.02

Degree Of Freedom = 3

Source: compiled by the author, based on survey results and SPSS Statistics analysis

To see if there are any dependencies across three separate dimensions, the author has performed a correlation test for collected data with the help of Spearman correlation coefficient (Table 10). The results suggest that Affective and Cognitive dimensions, as well as Behavioral and Cognitive dimensions, exhibit statistically significant positive moderate correlations as their p-values (<0,001) are lower than 0.05, while the relationship between Affective and Behavioral dimensions does not reach statistical significance with 0.166 p-value and don't have a significant correlation between each other. Thus, changes in the level of cognitive energy can affect the level of affective and behavioral separately and vice versa.

Table 10

Correlations

			Affective	Cognitive	Behavioral
Spearman's rho	Affective	Correlation Coefficient	1.000	.500**	.149
		Sig. (2-tailed)	.	<,001	.166
	Cognitive	Correlation Coefficient	.500**	1.000	.486**
		Sig. (2-tailed)	<,001	.	<,001
	Behavioral	Correlation Coefficient	.149	.486**	1.000
		Sig. (2-tailed)	.166	<,001	.

**. Correlation is significant at the 0.01 level (2-tailed).

Source: compiled by the author, based on survey results and SPSS Statistics analysis

Thus, empirical research comparing POE dimensions has focused on Cole et al.'s (2005; 2012) 14-item Productive Energy Measure (PEM) as a validated instrument. The study used a quantitative, cross-sectional Likert scale survey that collected responses from 44.5% of 207 employees across seven teams in the energy technology industry. Reliability analyzes confirmed the internal consistency of the PEM instrument. Descriptive statistics and Wilcoxon test showed that respondents rated cognitive and behavioral energy higher comparing to affective energy. While the correlation analysis revealed positive moderate correlations between the affective and cognitive dimensions and the behavioral and cognitive dimensions, whereas the relationship between the affective and behavioral dimensions was not significant. The Kruskal-Wallis H test revealed no significant differences in POE dimensions and aggregate POE levels between different teams, however between tenure groups the behavioral dimension appeared to be distinctive. Employees who work less than a year and more than 6 years rated behavioural energy higher than others. Thus, the results showed there is no difference of POE dimensions team groups, as employees generally rated the level of POE at X consistently.

3.2. Post hoc interview

After results were collected and analyzed author made a post hoc interview with some managers of the teams to present the results and ask additional questions as well as to give recommendation how it can be improved. The unstructured online video interview was

conducted almost a month after collection of results on 07.12.2023 with 8 managers from different departments. The call has been lasted for an hour. It started with the presentation of overall results and detailed answers per request. The author also presented the background theory on what can raise and what can lower the level of each of the POE dimensions. Based on this, followed by questions from the author to managers on what can be the reasons for the presented results. The call was recorded and transcribed in Microsoft Teams app. The main standpoints provided by managers shown in Table 11.

Table 11

Key questions and answers in post hoc interview

Question	Said by	Answer
Why do you think there is comparatively low level of affective energy throughout teams?	Delivery Lead	"We still provide the opportunity for employees to work from home and thus, sometimes it is hard to motivate them come to office for enhancing their emotional attachment to their team, however some people prefer to work at the office rather than online." "We have general Townhall meetings every half a year, [...] start with updates and achievements that present the manager of each department, some general information [...] can give awards during such meeting for those who accomplished some specific tasks [...] we also do Slido – a Q&A session, where we get feedback, ideas or questions from everyone".
	AR & CVMD Delivery Manager	"There are also specific days of the week when team leads require all team to come to office [...] or some onsite meeting where almost everyone required to be present plus there are different motivational events for the teams."
	Business Process Quality Specialist	"I can add here that we have InnovationLog in Finance where everyone can log their ideas for implementation [...] it can be some new way for automatic reconciliation, [...], etc. There is a team that prioritize those ideas and work on them [...], everyone can log this idea and we encourage employees to use this opportunity".

Question	Said by	Answer
What are the factors that enhance cognitive energy at the company in your opinion?	HR Team lead	"I think it is thanks to our learning system that employees can use for their self-development."
	Finance Service Delivery Lead	"In Finance we have compulsory courses for employees where they learn about the "financial" goals of the company and quarterly trainings."
Behavioural energy stands at the moderate level, any comments on that?	Delivery Lead	"I think every new employee adjust to our organization structure while doing onboarding training".
Do you do any trainings specifically for managers and team leads?	AR Team Lead	"Yes, I think each year [...] we had last trainings [...] Motiveeriv juhtimine (motivating leadership) on 17.03.2022 and on 21.03.2024 Motiveeriva tagasiside meistriklass (Motivational feedback masterclass)"

Source: compiled by the author, based on answers from interviewees

All in all, company representatives provided extensive information on the availability and ongoing initiatives in different teams that strengthen and maintain each of the POE dimensions. For example, each department has a process delivery manager and team leaders who manage all processes and tasks in their team, which emphasizes the presence of leadership figures in each team. To measure performance in each sub-team, key performance indicators are used for each task per each country where services are delivered. It is important to mention that the company uses internal communication methods provided by the Microsoft package, such as Teams, Outlook and Viva Engage. Moreover, each half of the year, top management regularly organizes general meetings attended by representatives from all teams and departments. The purpose of these meetings is to communicate key information, provide a more detailed understanding of the company and its strategic goals. These meetings provide an opportunity for employees to speak their minds on various issues, which reinforces the corporate culture and allows ideas to be communicated to the entire team. In addition, similar meetings are held quarterly in each department individually. Team management trainings such as "Motivational Leadership" or "Motivational Feedback Masterclass" are regularly organized for managers and team leaders. In addition, self-development opportunities for employees are provided through a variety of practical trainings, both in online and offline

formats. In addition, events are organized outside of working hours, where employees can not only have a good time, but also communicate with each other. Thus, it can be assumed that the company is committed to maintaining the level of POE dimensions as described by various scholars earlier. Presumably, the company has an high potential for significant POE dimensions levels among the teams given the following features in the company: managers play an important role in overseeing task performance and KPIs measure performance; internal communication tools and regular town hall meetings facilitate effective communication; finally, the company's commitment to team development is evident in regular training and self-development opportunities, which contributes to the creation of a strong team energy in the organization.

Consequently, the interview results revealed the extent to which the company recognizes the importance of maintaining certain POE dimensions in teams, how they do it and what practices use, and possible methods to improve the levels of dimensions. In the next section, the author will present the conclusions on the study, provides implications for other organizations, limitations and future research recommendations.

4. Discussion and conclusions

Hence, the study contributes to the emerging field of POE by providing an empirical insight into how different aspects of organizational energy play a significant role in multinational company in the energy sector, using a validated measurement tool and conducting a rigorous analysis. The findings not only benefit X by providing insights into the current dynamics of its POE, but also contribute to broader organizational research. The results of the study can serve as a benchmark for similar companies in the energy sector or other multinational organizations operating in Estonia and Eastern Europe.

4.1. Implication for company

Despite the fact that the answers showed quite favorable results for X, there is still room for improvement within the company. For instance, the results of descriptive statistics and Wilcoxon test showed that the level of affective energy is described as the lowest in the company. According to Borowik (2013) affective energy is stimulated through interaction between employees or Schudy and Bruch (2010) suggest that it is driven through a favorable work environment or autonomy. Thus, it can be recommended that managers and team leaders consider organizing more collective activities and find ways to entice employees to participate in them. This may have been a consequence of the covid pandemic and transition to remote working. As was pointed out by the company manager in the post hoc interview, the company has not abolished the possibility for employees to work from home. Therefore,

many people continue to work from a home office and occasionally come to office building. In this way, people lose the opportunity to work together with their colleagues and do not feel a sense of belonging. In this regard, another recommendation that can be given is to create ways to engage employees for onsite work more often and provide them with a collective feeling of teamwork and involvement in all the processes of the company.

On the other hand, the cognitive and behavioral energy dimensions were rated at the highest level. This is conditioned through the fact that employees clearly understand the shared goals, missions, processes, and strategies of the company. That is not surprising considering the fact that employees are regularly informed and trained on different subjects and projects within the company. In addition, they have a full possibility to adjust the workflow in particular appropriate way or suggest the ideas of process automations. According to the company representative, they have created a new initiative team that collects the innovation ideas from agents from all teams, analyze them, prioritize, and discuss how it can be implemented. The ideas can be registered to the application by any employee and the best outcome will be provided thanks to good communication between idea initiators, delivery managers and process quality assurance team. Moreover, there are different tools for every employee to improve their knowledge gap through different learning tools as well as the video training provided every quarter from different teams in the company.

As it is recommended by Grobler and Grobler (2021) the level of POE dimensions should be complemented by practices such as honest performance discussions aimed at ensuring a match between requirements and capabilities and needs and proposals. In post hoc interview the author discussed with company X representatives that each employee has an individual meeting with manager for Global Performance Management (GPM) target setting, where they conclude what was personally achieved by individual employee and what are the future developments and goals. In addition, they have regular meetings with all departments' employees for the direct communication on updates at the company. Therefore, we see that company X has moderate level of behavioral and cognitive energy. This may also be facilitated by the quite formalized nature of the Estonian branch's operations and reporting. However, it is recommended for team leads of company X to be more proactive in being the good example for team members, which can also be achieved through periodic trainings. The company X organizes such training for employees yearly, but it is recommended to do more often for improvement the level of behavioral energy.

The Wilcoxon and correlation test results indicated a mathematical similarity between cognitive and behavioral energies. This phenomenon can be explained by the fact that the

company's employees, in determining the degree and intensity of their actions (behavioral energy) in achieving the organization's goals, do so through their intellectual thinking, work problem solving and intellectual activity (cognitive energy). The company, in turn, promotes these aspects through various forms of communication with employees, such as general meetings or annual meetings between employees and managers to set goals. Thus, there is a direct relationship between cognitive and behavioral energy in the same time interval. Additionally, correlation analysis also revealed a relationship between cognitive and affective energies. This may be explained by similar methods of increasing the level of these energies, such as autonomy, direct communication, and prosocial influence.

The results of the study show that there are no differences between all categories of groups, except for the found difference in the levels of behavioral energy based on the work tenure groups in the company. Behavioral energy was found to be directly related to the level of formalization, policies, rules and leader's influence. As noted in the post hoc interview, new employees receive detailed instructions on work processes and other aspects of work. Thus, new employees rated the level of behavioral energy higher than more experienced colleagues who have been with the company longer due to their recent training, while those who work more than 6 years and rated behavioural energy level slightly lower than newcomers but still higher than all other tenure groups might be due to their high positions and the fact that they're the ones who create these onboarding trainings, instructions technicalities, etc. Hence, the difference between the tenure groups for behavioral energy.

Nevertheless, it is recommended to perform the POE level checkup periodically as the energy level may fluctuate due to any changes in the company, personnel, workload, etc.

4.2. Limitations and recommendations for future research

Although statistically the results were quite reliable, there are also limitations in this study, the elimination of which could have led to better results and more reliable findings. One such limitation is quite small sample in the study. For example, in the case of X, it is possible to estimate the POE not only in the Estonian branch, as there are quite a limited number of people working here, but also in other service branches and front offices in different countries. In this way it would be possible to see and compare the energy not only by teams but also by cultural dimensions. However, since it was not the aim of the study, I decided not to include the branches from other countries to avoid the cultural differences influence. Secondly, another problem that potentially affects the outcome is the respondents' understanding of the questions in the survey. According to the survey, respondents rated each statement on a scale from strongly disagree to strongly agree, but the issue is that people may

perceive a wording and its meaning differently. For avoiding this confusion, the author used the survey in 3 different languages, although there is still a possibility that the response style is different for everyone and thus, the problem remains. Furthermore, in this study was used the 14-item PEM measurement tool validated by Cole et al. (2012) and including three POE dimensions. Adjusting the 14-item statements, adding more, or considering more than three POE dimensions could lead to completely different results. Last but not least, with newly emerging technological changes and other global events there might be other factors that might influence on POE that might be neglected in the current study. For example, would be interesting to see how each employee's tenure in the company would influence the level of POE. Therefore, the author recommends taking these limitations for future studies in researching long-term trends, examining the level of POE aspects, and assessing how external factors affect organizational energy over time.

4.3. Conclusions

The purpose of the research was to compare POE dimensions in teams of different departments at the company X. Thereby, filling the gap in the developing field of POE in the business companies. As modern businesses face numerous challenges varying from technological developments to geopolitical crises, the ability of organizations to navigate these complexities and maintain high levels of collective energy stays crucial.

In the study, the author first delineated the meaning of POE, emphasizing the collective nature of POE, and identified and examined three dimensions of POE - affective, cognitive, and behavioral - and draw on the validated 14-item Productive Energy Measure (PEM) developed by Cole et al. (2012). It was found that POE is shared collective experience force of employees that help to achieve organizationally meaningful common goals in the company and consists of affective, cognitive, and behavioral dimensions, where affective energy is related to positive emotions and enthusiasm, cognitive energy is related to intellectual engagement and problem solving, and behavioral energy is related to actions that contribute to organizational goals.

To achieve the study aim, author analyzed different empirical studies on POE measurement and determined that the 14-item PEM developed by Cole et al. (2012) is the most widely applicable and reliably proved method of measuring POE by dimensions. The author also gave an overview of the researched sample which consists of 7 different teams of company X, how these teams operate between each other and what is organizational structure in the Estonian branch of company X. This research methodology, which included

distributing a cross-sectional survey to 207 employees from 7 different teams at X, resulted in an impressive response rate of 44.5%. Analysis of the responses showed high internal consistency for each dimension, which confirms the reliability of the chosen measurement tool. Descriptive statistics and Wilxocon test showed that, on average, respondents rated higher levels of cognitive and behavioral energies, and lower level of affective energy.

Further statistical analyses, including Spearman's correlation coefficient, revealed the relationship between the various POE dimensions. The results showed that there is some correlation between cognitive and behavioral, and affective and cognitive dimensions. Significantly, the Kruskal-Wallis H-test was used to compare POE across different teams in the company. Surprisingly, the results showed that there were no significant differences in the distribution of POE levels between the teams, indicating a uniform POE pattern in the organization, and thus it is good for the performance of all processes in the company as a whole. Furthermore, when examining the impact of employee tenures on POE levels, no statistically significant differences were found between the different categories except of behavioral dimension. Newcomers and more than 6 years-tenured employees rated behavioural energy higher than those who work 1 - 3 years and 4 - 6 years. Meaning that both the newcomers and more experienced employees of X perceive and contribute to affective and cognitive organizational energy in the same way.

In a post hoc interview conducted one month after the results were analyzed, eight executives provided insights on how they maintain the dimensions of productive organizational energy (POE). Highlights included challenges in maintaining affective energy when working remotely, emphasis on training systems for cognitive energy, and induction for behavioral energy. The organization demonstrated commitment through leadership, performance measures, communication tools, and continuous learning, indicating the potential to achieve significant levels of POE. The findings highlight the company's commitment to developing productive organizational energy.

In conclusion, the study of productive organizational energy (POE) is relatively new and there are still many things to learn and research. Many organizations even have no idea how important it is to understand and monitor the level of collective POE in the company. Therefore, this thesis investigates the measurement of productive organizational energy (POE) in X, a multinational power and technology company, and compares it across teams of different departments in Estonian branch. The results of this study should encourage other organizations to measure the level of POE in teams and work to improve the productive organizational energy of its employees.

Eventually, the study lays the foundation for a deeper understanding of organizational dynamics and resilience in the face of contemporary challenges.

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Thank you all for your priceless support and encouragement.

Appendix A

Landscape orientation of the methods and results of different empirical studies on measuring POE

Authors	Aim/essence	Dimensions	Method/measures	Results
Cole et al., 2005	"Development of the Productive Organizational Energy (POE) measure that can be used to study energy in organizations" (p.1)	Emotional, cognitive, and behavioral at individual level	Survey - 17-item measure; exploratory factor analysis (EFA) and confirmatory factor analysis (CFA)	Measured the reliability of 17 item survey where 3 was eliminated since didn't meet criteria.
			Survey - 16-item measure; confirmatory factor analysis (CFA)	There is a variation in terms of POE individual scores across departments
			Survey - 16-item measure at individual-level and department-level + other measures: collective meaningfulness (three-item scale), autonomy (four-items scale), motivation (six-items scale), job involvement (four-items scale), efficacy beliefs (four-items scale), goal commitment (four-items scale), job satisfaction (three-items scale) and sample covariates (two)	POE can be used as a valid measure of productive energy at the department level and individual level.

Authors	Aim/essence	Dimensions	Method/measures	Results
Cole et al., 2012	"To empirically demonstrate that the energy collectively experienced by individuals at work can have a measurable impact on organizationally relevant criteria as a whole." (p.445)	Emotional, cognitive, and behavioral	Hypothesis testing; PEM at individual-level; exploratory factor analysis (EFA) and confirmatory factor analysis (CFA); 14-item measure	Three dimensions of productive energy (affective, cognitive, behavioral) contribute to an overall construct of productive energy
			Hypothesis testing; PEM at individual-level; exploratory factor analysis (EFA) and confirmatory factor analysis (CFA); 16-item measure	
			Hypothesis testing; PEM at individual-level; exploratory factor analysis (EFA) and confirmatory factor analysis (CFA); 14-item measure	There is a difference of POE at individual level and work level, distinct and positive relation POE to collective constructs of motivation, efficacy, cohesion, and autonomy and distinct and negative relation to collective exhaustion, POE's positive relationship with goal commitment, organizational commitment and job satisfaction, as well as after controlling for the effects of collective motivation, effectiveness, cohesion, autonomy and exhaustion Productive Energy is positively related to firm performance

Authors	Aim/essence	Dimensions	Method/measures	Results
Cuff & Barkhuizen, 2014	“To validate the Productive Energy Measure in the South African context, and to determine whether construct equivalence was present for White and African ethnic groups.” (p. 263)	Emotional, cognitive, and behavioral	Cross-sectional survey, Hypothesis testing, Cole et al. (2012)'s PEM 14 items measure	Responses showed average scores on all three dimensions, with nonsignificant differences between each of them, resulting in confirmation that POE is a three-dimensional construct, equivalence exists for both White and African employees, and there is acceptable internal consistency for PEM.
Derman et al., 2011	"To validate a measure of organizational energy in the South African context and to investigate whether there are differences in organizational energy as perceived by employees based on their demographic characteristics and lifestyle variables" (p.1)	EnergyScapes Profile (Tosey & Smith, 1999): inspiration, integration, meaning, community, control, activity, and existence	Cross-sectional survey design, EnergyScapes Profile (Tosey & Smith, 1999); the Kaiser-Meyer-Olkin (KMO) analysis, exploratory factor analysis, reliability analysis (Cronbach Alpha coefficients)	"Statistically significant differences in the organizational energy levels of employees based on age, tenure, geographical region, relaxation, hypertension and diabetes, depression or psychosis" (p.1)
Grobler & Grobler, 2021	“Determine the relationship between Ethical Leadership and productive energy (PE), as mediated by person-organizational fit (POF)” (p.21)	Ethical leadership (EL), Productive energy (PE), Person-organizational fit (POF)	A cross-sectional survey study, Cole et al. (2012)'s PEM 14 items measure; The Ethical Leadership Questionnaire (ELQ; De Hoogh & Den Hartog, 2008); Cable and Judge (1996) instrument for measuring Person-organizational fit; correlation - Pearson’s product moment correlations; T-test for significance, The Bonferroni correction method to adjust the	“The results indicate a good fit of the conceptual model, for both the combined group, [...] and sectors respectively [...].” (p.33). The result shows that POF is a mediating variable in the relationship between EL and PE, while EL has a significant positive effect on PE and POF.

Authors	Aim/essence	Dimensions	Method/measures	Results
			probability(p) values was utilized to mitigate the risk of a Type I error, Hierarchical regression analysis was used to determine the amount of variance explained in the predicted variable by the predictor variables; exploratory factor analysis (EFA) and confirmatory factor analysis (CFA)	
Kipfelsberger et al., 2019	"[...] how and when a firm's level of customer contact influences productive organizational energy" (p.938)	Affective, cognitive, and behavioral dimensions	9-item scale of Grant (2008) for measuring customer contact; 3-item scale of Grant (2008) for prosocial impact and 14-item scale measure (Cole et al., 2012) for POE, Transformational Leadership Behavior Inventory of N. P. Podsakoff et al. (1990) to assess the transformational leadership climate;	Organizations with a high level of customer contact demonstrate a higher degree of prosocial impact, which is enhanced by a climate of transformational leadership, and, accordingly, higher productive organizational energy, enhancing the degree to which the company achieves its goals.

Authors	Aim/essence	Dimensions	Method/measures	Results
Kunze & Bruch, 2010	"Address the role of age-based faultiness in relation to the perceived productive energy of work teams and transformational leadership. as a potential moderator of this relationship" (p. 593)	Emotional, cognitive, and behavioral	Hierarchical regression analyses; three different aggregation statistics (rwg, ICC1, ICC2). Age-based faultline score by Shaw (2004), 14-item scale measure (Cole et al., 2012) for POE, Bass and Avolio's (2000) multifactor leadership questionnaire (MLQ 5x–short) for transformational leadership (TFL)	Age differences negatively affect team productive energy perceptions to a minor degree, namely group productivity and behavioral integration. Teams consisting the same gender, experience, and age individuals with a high level of awareness of transformational leadership are significantly better at realizing their energy potential as a group than teams with low scores on this variable.

Source: compiled by the author, based on sources in the table

Appendix B

14-item Productive Energy Measure (Cole et al., 2012)

Affective dimension:

People in my work group feel excited in their job.

People in my work group feel enthusiastic in their job.

People in my work group feel energetic in their job.

People in my work group feel inspired in their job.

People in my work group feel ecstatic (overwhelming happiness or joyful excitement) in their job.

Cognitive dimension:

My work group is ready to act at any given time.

People in my work group are mentally alert.

In my work group, there is a collective desire to make something happen.

People in my work group really care about the fate of this company.

People in my work group are always on the lookout for new opportunities.

Behavioral dimension:

People in my work group go out of their way to ensure the company succeeds.

People in my work group often work extremely long hours without complaining.

There has been a great deal of activity in my work group.

People in my work group are working at a very fast pace.

Appendix C

Survey form sent to employees for measuring POE dimensions.

Productive Organizational Energy in the Company X

Dear Colleague,

Thank you for participating in the survey I am conducting at the University of Tartu for my master thesis. Your valuable input is essential for my research project titled Productive Organizational Energy in the Company X.

Productive organizational energy is a collective experience consisting of emotional, cognitive, and behavioral dimensions aimed at achieving organizational common goals (Cole et al., 2005, 2012). The higher the energy the better the performance, job satisfaction etc. of the teams. The purpose of this survey is to collect data regarding the previously mentioned productive energy dimensions in different teams at our company and analyze what the level of productive energy is. The survey will take approximately 5 minutes to complete.

Your responses will be kept confidential, and your identity will remain anonymous throughout the study. No personal data will be collected. The data is solely used for completion of the master thesis and will not be shared anywhere else.

If you agree to participate under these terms, please scroll a bit down to begin the survey. If you do not agree, please close the survey window.

Thank you for your cooperation and contribution to my research.

Sincerely,

Anna Oleksenko

anna.oleksenko@xxx.com

1. **Job title/team:**
   - GA Reporting
   - GA Support
   - AR
   - CVMD
   - AP Rec & Reporting
   - AP Payments
   - GTS
   - AP Invoice Processing
   - CSS SCM
   - HR Operations

- Engineering & Commissioning
- Project & Site Management
- Supply management
- Sales & Marketing
- Service
- Other

2. How many years have you been with this company?

- Less than 1 year
- 1 - 3 years
- 4 - 6 years
- more than 6 years

3. Please rate the degree to which you agree with each of the following statements:

	Strongly disagree	Rather disagree	Neutral	Rather agree	Strongly agree
People in my work group feel excited in their job.	○	○	○	○	○
People in my work group feel enthusiastic in their job.	○	○	○	○	○
People in my work group feel energetic in their job.	○	○	○	○	○
People in my work group feel inspired in their job.	○	○	○	○	○
People in my work group feel ecstatic (overwhelming happiness or joyful excitement) in their job.	○	○	○	○	○

	Strongly disagree	Rather disagree	Neutral	Rather agree	Strongly agree
My work group is ready to act at any given time.	○	○	○	○	○
People in my work group are mentally alert.	○	○	○	○	○
In my work group, there is a collective desire to make something happen.	○	○	○	○	○
People in my work group really care about the fate of this company.	○	○	○	○	○
People in my work group are always on the lookout for new opportunities.	○	○	○	○	○
People in my work group go out of their way to ensure the company succeeds.	○	○	○	○	○
People in my work group often work extremely long hours without complaining.	○	○	○	○	○
There has been a great deal of activity in my work group.	○	○	○	○	○
People in my work group are working at a very fast pace.	○	○	○	○	○

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Resümee

Pealkiri: Produktiivne Organisatsiooniline Energia Ettevõttes X

Lõputöö eesmärgiks on võrrelda energiasektori ettevõtte X erinevate meeskondade produktiivse organisatsioonilise energia (POE) dimensioone. Sellega täiendatakse äriettevõtetes arenevat, kuid väheuuritud POE valdkonda. Seistes silmitsi kiire tehnoloogilise arengu, geopoliitiliste kriiside ja majandusliku ebastabiilsuse väljakutsetega, on ettevõtete jaoks oluline säilitada oma kollektiivse energia taset, kasutades selleks kolme dimensiooni: töötajate afektiivseid, kognitiivseid ja käitumuslikke ressursse.

POE dimensioonide mõõtmiseks kasutati valideeritud 14-väitelist küsimustikku, mille autoriks on Cole et al. (2012). Valimisse kuulus 88 inimest seitsmest osakonnast. Selgus, et ettevõttes on üldiselt kõrgem kognitiivse ja käitumusliku POE tase, afektiivse POE tase on veidi madalam. Eri osakondade lõikes tulemused ei erinenud. Staaži lõikes olid afektiivse ja kognitiivse POE tulemused samuti sarnased. Küll aga näitasid kõige väiksema ja kõige kõrgema staažiga (rohkem kui 6 aastat) vastajad kõrgemat käitumusliku POE taset.

Organisatsiooni produktiivse energia (POE) valdkond on suhteliselt uus ja veel on palju aspekte, mida õppida ja uurida. Paljud organisatsioonid isegi ei tea, kui oluline on ettevõttes mõista ja jälgida kollektiivse POE taset. Selle uuringu järeldused peaksid julgustama teisi organisatsioone mõõtma POE taset meeskondades ja töötama selle nimel, et parandada oma töötajate produktiivset organisatsioonilist energiat. Uuringu tulemused annavad empiirilise panuse POE arenevasse valdkonda, pakkudes sarnastele ettevõtetele võimaluse võrrelda POE mõõtmeid enda ettevõtte meeskondades. Uuring paneb aluse tulevastele uurimustele, mis käsitlevad pikemaajalisi suundumusi ja sekkumisi, mille eesmärk on parandada konkreetseid POE dimensioone ning luua alus organisatsiooni dünaamika ja vastupanuvõime sügavamale mõistmisele tänapäevaste väljakutsetega silmitsi seistes.

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