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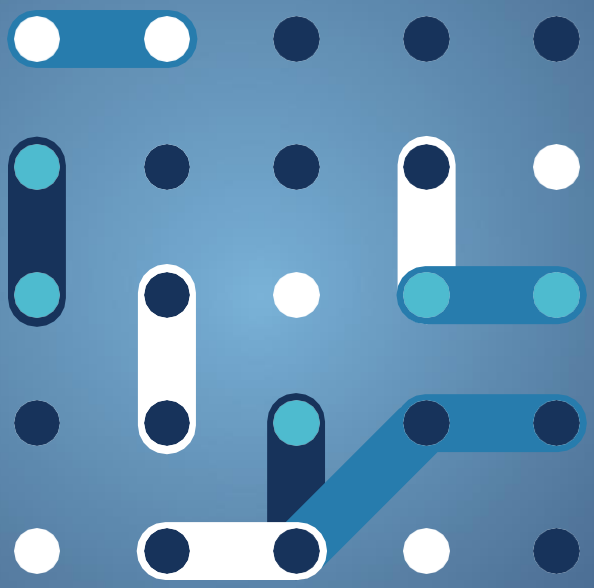
Business Model Tools for beginners

BRIDGE Business Model Working Group Task 1



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Executive Summary

Introduction to the BRIDGE Business Model Tools Guide

This guide takes you through the basics of business model concepts in a clear and accessible way.

In the realm of innovation and project development, understanding and crafting a robust business model is essential. A well-thought-out business model not only outlines the roadmap for project success but also ensures that your innovation can achieve sustainable growth and deliver value. For projects within the BRIDGE Community, this means navigating the unique challenges and opportunities of the energy landscape with a strategic approach.

Our goal is to make this knowledge not just accessible but actionable, enabling you to design business models that are relevant with the unique challenges and opportunities of your projects within the BRIDGE Community. This guide is also an invitation to engage with the broader BRIDGE Community. Sharing insights, challenges, and successes is at the heart of what makes BRIDGE a powerful initiative. As you explore and apply the concepts in this guide, we encourage you to share your experiences with fellow project partners. Together, we can drive innovation forward, turning obstacles into stepping stones for success.

This guide introduces you to the business model tools within the BRIDGE community.

There are countless examples of specific business models regarding the vast number of exploitable results that are created within BRIDGE related projects and as such, it would be a monumental task to cover them all. This guide does not cover cash flow analysis concepts.

For more specific types of business models for specific types of innovations, it is best to seek guidance using the BRIDGE repository and reaching out to the BRIDGE community.

What is a business model?

A business model serves as a strategic blueprint for how an organisation intends to generate revenue and sustain its operations. It details the rationale behind a company's product or service offerings, customer engagement, and profitability strategies. Specifically, it describes the company's operations, target customer base, and revenue streams. This framework is critical not only for internal operational guidance but also for communicating strategic intent to stakeholders such as investors, partners, and customers.

A robust business model articulates how a company will reach and serve its customers, maintain efficient operations, and remain competitive in the market. It identifies key activities, resources, and partnerships essential for success, outlining how value will be created and delivered. This focus is essential for achieving organisational objectives.

Moreover, a well-defined business model facilitates the alignment of internal goals with external expectations, enhancing operational coherence and strategic focus. As a dynamic document, the business model adapts over time to accommodate growth and respond to emerging challenges and opportunities. Ultimately, it provides a clear roadmap for a company's sustained success and viability in the marketplace.

A business model is *not* a static document that precisely depicts reality; it describes hypothesis and assumptions that are only as valid as the evidence that supports it, and the only true validation of any business model, is whether or not there is a paying customer. Without paying customers, the business model is a hypothesis that needs pivoting and further validation.

1. Business Models in the Energy Sector

Understanding business models in the energy sector involves comprehensively examining the frameworks through which companies create, deliver, and capture value in the context of generating, distributing, selling energy; and through which they contribute to balance the grid, to offer new products and service infrastcuture, to bill and much more. This sector is diverse and ranges from traditional fossil fuels, nuclear energy, and renewable sources such as solar, wind, hydroelectric, biomass to flexibility solutions, electric vehicles, and industrial processes. Moreover, with new emerging technologies such as vehicle to grid, battery storage, flexibility solutions the business models within this sector are equally varied, reflecting the technological, regulatory, environmental, and economic contexts in which they operate.

At its core, a business model in the energy sector needs to address several key components: the energy source, the technology for harnessing this energy, the market structure, regulatory environment, customer engagement strategies, infrastructure needs and value proposition. The evolution from traditional fossil-based sources to renewable and sustainable sources needs innovative business models that not only address economic viability but also environmental sustainability, social responsibility, the complexity of the distribution grid, and adjacent sectors such as heating and cooling.

Traditional energy companies, primarily focused on oil, gas, and coal, have historically operated under models that emphasise scale, extraction efficiency, and distribution networks. These models are capital intensive, focusing on large-scale operations designed to extract and distribute fossil fuels to meet global energy demands. The pricing mandating mechanisms, revenue streams and cost structures in these models are closely tied to global commodity markets and geopolitical factors.

In contrast, renewable energy companies often use technology-driven business models. These models prioritise decentralisation, sustainability, and technological innovation. For example, solar energy companies might adopt models that sell or lease solar panels to homeowners, offer power purchase agreements, or provide community solar programmes. These models are characterised by their flexibility, scaleability, and customer-centric approaches. They focus on reducing carbon footprints, enabling energy independence, and providing long-term, cost savings for consumers.

The transition to a more sustainable energy landscape has also given rise to service-oriented models, such as energy-as-a-service, which offers energy solutions on a subscription basis, focusing on energy efficiency, cost savings, and reducing capital expenditures for customers. Regulatory frameworks and policy incentives play a crucial role in shaping business models in the energy sector. Governments worldwide are implementing policies to promote renewable energy adoption, reduce greenhouse gas emissions and encourage investment in clean energy technologies. These policies can significantly impact business models by altering market dynamics, introducing subsidies, tax incentives, or carbon pricing mechanisms, and mandating renewable energy targets. And as such, they are important aspects to take into consideration when developing business models within BRIDGE related projects as the regulatory and technological landscape is ever changing.

In conclusion, understanding business models in the energy sector requires a holistic view of the interplay between technology, market forces, regulatory environments, and societal demands for sustainable and reliable energy. As the sector continues to evolve in response to these factors, we can expect to see further innovation and diversification in business models, driving progress towards a more sustainable and efficient global energy system.

In this sense, this guide will avoid in-depth analysis of any particular business model as that analysis most likely will be outdated.

1.1 Key Components of Business Models

Below are several key components of business models that, together, define how companies operate, generate revenues, and deliver value to their customers and stakeholders

A. Value Proposition: the value proposition is at the core of any business model, defining the unique benefits and solutions that an energy company offers to its customers. For traditional energy companies, the value proposition might focus on reliable and efficient energy supply at competitive prices. In contrast, renewable energy companies might emphasise sustainability, environmental benefits, and long-term savings on energy costs.

B. Customer Segments: identifying the target customer segments is crucial for tailoring marketing strategies, product offerings, and customer service. Energy companies might serve a wide range of customers, including residential, commercial, industrial, and governmental entities, each with distinct needs and preferences.

C. Energy Source and Technology: this component encompasses the technical and material basis of the energy being produced, whether it is fossil fuels, nuclear, or renewable sources like wind, solar, or bioenergy. The technology used for energy conversion, efficiency, storage, and distribution is also a critical aspect, influencing cost structures, operational processes, and the overall competitiveness of the business.

D. Market Structure and Position: understanding the market structure involves analysing the competitive landscape, regulatory environment, and market dynamics. It includes assessing the level of competition, barriers to entry, market demand, and the company's position within this ecosystem. This component guides strategic decisions related to market entry, expansion, pricing, and competitive differentiation.

E. Revenue Streams: revenue streams define how an energy company makes money. This could include direct sales of energy, service contracts, leasing, or financing arrangements for energy infrastructure (like solar panels), government subsidies, and incentives for renewable energy production, or selling carbon credits in emission trading schemes.

F. Cost Structure: the cost structure details the major costs involved in operating the business, including capital expenditure for infrastructure development, operational costs (such as fuel costs for traditional energy companies or maintenance costs for renewable energy installations), marketing, and administrative expenses.

G. Sales and Distribution Channels: this component outlines how energy products and services are delivered to customers. It could involve direct sales, partnerships with utility companies, online platforms for selling renewable energy systems, or distributing networks for oil and gas. The effectiveness of these channels directly impacts customer access and satisfaction.

H. Customer Relationships: maintaining and developing customer relationships is vital for ensuring customer satisfaction, loyalty, and engagement. This can involve customer service, personalised energy management solutions, incentives for renewable energy adoption, and community engagement initiatives.

I. Regulatory Compliance and Incentives: energy companies must navigate complex regulatory environments, which can vary significantly by region and energy type. Compliance with regulations,

leveraging government incentives, and participating in environmental programmes are essential for legal operations and competitive advantage.

J. Sustainability and Environmental Impact: given the global push towards sustainability, business models in the energy sector increasingly incorporate strategies to minimise environmental impact, reduce carbon emissions, and contribute to a sustainable energy future. This not only addresses regulatory and societal pressures, but also opens opportunities for innovation and new markets.

1.2 Two Examples of Business Models in the Energy Industry

To illustrate the practical application of the components discussed above, we use two examples of relevant business models within the energy sector, focusing on their value creation, capture and delivery mechanisms. These examples span different segments of the energy market: one from the renewable sector and another from the traditional energy sector, showcasing the diversity of strategies employed to achieve success.

Electric Vehicle Manufacturers

Electric vehicle manufacturers go or have often gone further than only focusing on the sale of vehicles; they branch out into different areas as their technology enables them to provide value beyond transportation. They identify additional value through their innovation processes in for e.g. energy storage and distribution, e.g. solar panel installations, Powerwall batteries, utilising Vehicle to X and becoming a balancing responsible party. By integrating these technologies, electric vehicle manufacturers can offer more holistic energy solutions that enable residential and commercial customers to generate, store, and manage their energy usage effectively, in addition to their core business of delivering transport solutions.

Additionally, their business models leverage regulatory incentives for renewable energy adoption, such as tax credits and rebates, which enhance customer acquisition and retention.

Distribution System Operator

The traditional business model of a power grid distribution system operator primarily focuses on managing and maintaining the infrastructure necessary for delivering electricity from generation points to end consumers. This includes the upkeep of power lines, substations, transformers, and metering systems to ensure reliable service. Operators must also comply with a range of regulatory standards that cover safety, reliability, and environmental impact, which are critical for maintaining operational licences and avoiding penalties.

Financially, these operators generate revenue through tariffs that are regulated and designed to cover operational and maintenance costs while providing a return on investments. These costs are typically passed onto consumers in their electricity bills. The model also encompasses customer service responsibilities like metering, billing, and handling service issues. To enhance efficiency and adapt to changing demands, operators are increasingly investing in smart grid technologies which support real-time monitoring and data analytics, essential for managing system load and improving service delivery.

With new emerging technologies, distribution system operators are exploring different ways to generate revenue as entities such citizen energy communities are becoming more common, and they can shoulder an additional role as a service and maintenance company for smaller entities.

1.3 Identifying Target Customers

Identifying the ideal customer for an idea is foundational to the success of any business venture. This process ensures that product development, marketing strategies, and sales efforts are all aligned with the needs,

preferences, and behaviours of the most relevant and profitable market segments. By understanding who the ideal customer is, businesses can tailor their value propositions more effectively, thereby enhancing customer satisfaction, loyalty, and lifetime value. Furthermore, having a clear picture of the ideal customer aids in efficient resource allocation, directing time and capital towards the most impactful activities that drive growth and profitability. It also facilitates better communication with investors and stakeholders, as it demonstrates a focused and strategic approach to market penetration and expansion. Ultimately, identifying the ideal customer is not just about selling a product or service; it's about creating and delivering solutions that meet the specific needs of a targeted group, thereby ensuring the long-term viability and success of the business.

Identifying the ideal customer can greatly benefit from a set of strategic workshop techniques and tools focused on understanding customer behaviours, needs, and experiences. Below are a few suggestions that emphasise customer journey mapping and related strategies. You can find templates and guides by searching online.

1.3.1 Examples of Tools to Use to Identifying the Ideal Customer

1. **Customer Journey Mapping:** This tool involves creating a visual representation of every interaction your customer has with your business, from initial awareness through various touchpoints to post-purchase behaviour. It helps in identifying key moments that matter to the customer, allowing businesses to tailor their offerings and touchpoints accordingly.
2. **Empathy Mapping:** A workshop activity where teams create a detailed map of what the customer is thinking, feeling, seeing, hearing, and doing. It helps in gaining a deeper understanding of the customer's emotional and rational response towards your product or service.
3. **Persona Development Workshops:** These workshops involve creating detailed profiles of the ideal customers, including demographic information, behaviours, motivations, and goals. Personas help in making customer-focused decisions across product development and marketing.
4. **Storyboarding:** A narrative tool that combines visuals and text to tell the story of the customer's experience. By storyboarding the customer's journey, teams can visualise and understand the emotional journey of a customer, from encountering a problem to finding a solution through your product or service.
5. **Prototyping and User Testing:** Creating quick and rough versions of products or features and testing them with real or potential customers can provide invaluable feedback on their needs and experiences. This iterative process helps refine offerings to better suit the ideal customer profile.
6. **Service Blueprinting:** An extension of customer journey mapping, service blueprinting lays out the process, touchpoints, and backend actions (visible and invisible to the customer) required to deliver a service. It's particularly useful for understanding and optimising the customer experience in service-oriented businesses.

2. Tools for Developing Business Models for BRIDGE Projects

Within BRIDGE projects, two primary tools are used as a de facto standard for developing business models. Whilst there are additional tools and some that have been tailor-made for energy-related projects within BRIDGE and similar initiatives, these are the most common ones that often are expanded upon to fit more specific innovations. In essence, by understanding these tools you can easily recognise concepts in other more advanced, elaborate or specific business model tools as they use the same modus operandi, concepts and language. In this section we will go deeper into these two tools and have a brief overview of other types of models and finally the technological readiness levels that are a de facto standard when communicating the maturity of a technology.

The tools are:

- Business Model Canvas
- Value Proposition Canvas
- Technological Readiness Levels

This part of the guide will provide an overview of each tool, including examples and templates to help you understand how they can be applied to your project.

2.1 The Business Model Canvas (BMC)

The BMC is a strategic management tool designed to visually depict the key components of a business model. Developed by Alexander Osterwalder in his doctoral dissertation at the University of Lausanne in 2004, the BMC has since become a pivotal framework for entrepreneurs, startups, and businesses across various sectors to conceptualise, develop, and iterate on their business models.

The BMC consists of nine core elements: Key Partners, Key Activities, Key Resources, Value Propositions, Customer Relationships, Channels, Customer Segments, Cost Structure, and Revenue Streams. These elements provide a comprehensive overview of how a company creates, delivers, and captures value. The visual nature of the BMC facilitates understanding and collaboration among stakeholders, making it an essential tool for strategic planning and communication.

In the context of the energy sector, particularly within Horizon funded energy projects, the BMC can serve as a critical analytical tool. Many such projects, driven by innovation and research, focus on technological development and scientific advancements. However, for these projects to transition from research to market, a clear understanding of the business model is crucial. This is where the BMC becomes particularly valuable.

The BMC offers a structured method to evaluate the commercial viability of their innovations. It encourages teams to identify their value propositions for various customer segments, consider how relationships with those customers will be built and maintained, and determine the channels through which the value will be delivered. Furthermore, it prompts a detailed analysis of the resources and partnerships necessary for project success, the cost structure, and potential revenue streams.

An example of its application could be in a project developing new renewable energy technology. By using the BMC, the project team can systematically identify potential customers (e.g., energy companies, governments, residential communities), define the value proposition (e.g., cost savings, sustainability, energy independence), and outline how the technology will reach the market (e.g., through direct sales, partnerships, or licensing). Additionally, the BMC can help in pinpointing the key resources needed (e.g., technology, expertise, capital) and in mapping out the financial aspects (e.g., investment required, pricing strategy, revenue forecasts).

Below are the nine components covered by the BMC:

1. Key Partnerships: These are the network of suppliers and partners that make the business model work. They can involve strategic alliances, supplier agreements, and other partnerships that allow the company to focus on its core activities.

2. Key Activities: The most important activities in executing a company's value proposition. This could include production, problem solving, or platform/network management that are essential to delivering the product or service to the customer.

3. Key Resources: The assets required to offer and deliver the previously mentioned elements (e.g., value proposition, reach markets, maintain customer relationships, etc.). Resources can be physical, financial, intellectual, or human.

4. Value Propositions: The collection of products and services that create value for a specific Customer Segment. This is what makes a customer choose one company over another, which can be in the form of quality, performance, customisation, or brand/status.

5. Customer Relationships: The types of relationships a company establishes with specific Customer Segments. Relationships can range from personal to automated, and from transactional to long-term.

6. Channels: The ways in which a company communicates with and reaches its Customer Segments to deliver a Value Proposition. Channels are touchpoints that play an integral role in the customer experience.

7. Customer Segments: The different groups of people or organisations an enterprise aims to reach and serve. Customers can be segmented into distinct groups with common needs, behaviours, or other attributes.

8. Cost Structure: The business model elements resulting in the company's expenses. Costs may be calculated relative to the key activities, resources, and partnerships.

9. Revenue Streams: The way a company makes income from each Customer Segment. Revenue streams can be generated through one-time payments or recurring payments (e.g., subscriptions, leasing).

By laying out these components on a single canvas, organisations can easily visualise their business model, allowing for analysis, testing, and iteration. This holistic view helps stakeholders understand how various elements fit together and how changes in one area might affect others. In practical use, the BMC facilitates discussions and alignment within teams, provides a clear overview for external stakeholders, and serves as a baseline for further business planning and strategy development.

2.1.1 Business Model Canvas Example

Idea: FlexLocalExchange

The innovative local flexibility market for energy revolutionises the way energy is produced, traded and consumed at a community level. By leveraging a state-of-the-art digital trading platform, we connect local renewable energy producers with consumers and utility companies, enabling real-time trading of energy and flexibility services. This not only provides a new revenue stream for producers and cost savings for consumers but also enhances grid reliability and promotes sustainability. Our platform is supported by key partnerships with technology providers, distribution system operators, and regulatory bodies, ensuring a seamless, efficient, and compliant operation. Through personalised support, community engagement and a user-friendly interface, we empower participants to actively contribute to a more sustainable and resilient energy

future. Our business model focuses on creating value for all stakeholders, driving the transition towards a more flexible, decentralised, and green energy system.

The Business Model Canvas:

For a hypothetical local flexibility market for energy, the BMC can be detailed as follows:

1. Key Partnerships

Local energy producers: Including renewable energy farms (solar, wind, hydro) to ensure a diverse supply of energy. Distribution system operators: To manage the distribution of energy within the local grid efficiently. Technology providers: Companies that provide the platform and technologies for energy monitoring, trading, and management. Regulatory bodies: To ensure compliance with energy trading regulations and to foster sustainable energy practices.

2. Key Activities

Platform development and maintenance: Developing and maintaining the digital platform that facilitates energy trading. Market matching: Automatically matching energy supply with demand to optimise the local grid's efficiency. Customer support and education: Providing support and information to participants on how to use the market effectively. Regulatory compliance: Ensuring that all trading activities comply with local and national energy regulations.

3. Key Resources

Digital trading platform: A robust platform that supports real-time trading of energy flexibility. Data analytics capabilities: For predicting energy supply and demand and optimising grid performance. Expertise in energy markets and technology: Knowledgeable personnel to develop, operate, and support the platform. Network infrastructure: Physical and IT infrastructure to support energy trading and distribution.

4. Value Propositions

Increased revenue for energy producers: Offering a new revenue stream by selling excess energy or flexibility services. Cost savings for consumers: Allowing consumers to buy energy at more competitive, often lower, prices. Enhanced grid reliability: Contributing to grid stability by balancing supply and demand locally. Sustainability: Promoting the use of renewable energy sources and supporting the transition to a more sustainable energy system.

5. Customer Relationships

Self-service portal: Enabling customers to buy, sell, and manage their energy transactions online. Personalised support: Dedicated support for significant participants like large energy producers or industrial consumers. Community engagement: Building a community around sustainable energy practices and local energy resilience.

6. Channels

Online platform: A web-based portal or mobile app for trading energy and managing accounts. Social media and marketing: To engage with potential participants and educate the public about the benefits of the local flexibility market. Workshops and seminars: For direct engagement with communities, businesses, and potential partners.

7. Customer Segments

Residential energy consumers: Looking for cheaper and more sustainable energy sources. Commercial and industrial energy users: Seeking to reduce energy costs and potentially monetise their energy flexibility. Renewable energy producers: Small to medium scale producers looking for additional revenue streams. Utility companies: Interested in balancing supply and demand more efficiently and in a cost-effective manner.

8. Cost Structure

Platform development and operation costs: Initial development and ongoing operational expenses. Marketing and customer acquisition costs: Expenses related to attracting participants to the platform. Personnel costs: Salaries for staff managing the platform, customer service, and regulatory compliance. Technology upgrades and maintenance: Regular updates to software and hardware to ensure reliability and efficiency.

9. Revenue Streams

Transaction fees: Charging fees for each energy transaction made through the platform. Subscription fees: Monthly or annual fees for access to premium features of the platform. Consulting services: Offering expert advice and solutions for energy management and sustainability practices. Data analysis services: Providing insights and forecasts related to energy markets and grid optimisation.

Example activities to add information to the business model canvas:

To apply the BMC here are examples of activities that can help flesh out each building block.

1. Key Partnerships

Activity: Partnership Mapping Workshop

Example: Organise a session to identify and categorise potential partners across various categories (suppliers, distributors, strategic allies). Use tools like mind maps to visualise relationships and discuss how each partner can contribute to your business model.

2. Key Activities

Activity: Process and Value Chain Analysis

Example: Break down the core processes and activities essential to delivering your value proposition. This could involve flowcharting your operational processes, from production to delivery, identifying key activities that drive competitive advantage.

3. Key Resources

Activity: Resources Audit and Gap Analysis

Example: Conduct an audit of your current resources (physical, intellectual, human, financial) and perform a gap analysis against what's needed to execute your value proposition successfully. This helps in prioritising resource acquisition and development.

4. Value Propositions

Activity: Value Proposition Design Sessions

Example: Use the Value Proposition Canvas to detail the customer job(s), pains, and gains, mapping out how your products/services alleviate those pains and create gains. Prototyping and feedback loops with potential customers can refine these propositions.

5. Customer Relationships

Activity: Customer Journey Mapping

Example: Map out the customer journey for different segments, identifying all touchpoints with your business. This exercise helps in understanding how to tailor customer relationships and interactions at each stage of the journey.

6. Channels

Activity: Channel Research and Experimentation

Example: Investigate various distribution and communication channels, both direct and indirect, to reach your customer segments. Experiment with a mix of channels, measuring effectiveness in terms of reach and engagement.

7. Customer Segments

Activity: Market Segmentation and Persona Development

Example: Segment the market based on demographic, psychographic, and behavioural factors. Develop detailed personas for each segment to better understand their needs, behaviours, and how they might interact with your value proposition.

8. Cost Structure

Activity: Cost Analysis Workshop

Example: Break down your business model's cost structure, identifying fixed and variable costs. Use activities like brainstorming and scenario analysis to project how these costs might scale with different business volumes.

9. Revenue Streams

Activity: Revenue Stream Modelling

Example: Explore and model various revenue streams (e.g., product sales, subscriptions, licensing, advertising). Use financial projections and scenarios to assess the viability and sustainability of each revenue stream.

Implementing these activities helps in deeply understanding each building block of the BMC, ensuring a comprehensive approach to business model development. It's important to engage a cross-functional team in these activities, incorporating diverse perspectives and expertise to enrich the development process. Iteration and validation with real-world feedback are key to refining the business model over time.

2.2 The Value Proposition Canvas

The Value Proposition Canvas is a tool in the strategic management and design of products and services that complements the BMC by delving deeper into the customer product relationship. It comprises two main components: the Customer Profile and the Value Map, each designed to ensure that the product or service's features aligns with the customer's needs and desires.

The effectiveness of the Value Proposition Canvas lies in its ability to ensure a precise alignment between what the product offers and what the customer segment values. It encourages a deep dive into the customer's world, promoting empathy and understanding that are critical for the successful design and delivery of value propositions.

Customer Profile

This segment of the canvas is dedicated to understanding the customer. It is subdivided into three sections:

1. Customer Jobs: These are tasks the customers are trying to complete, problems they are trying to solve, or needs they wish to satisfy. Within the energy sector, for instance, a customer job might be the need to reduce energy costs or to transition to more sustainable energy sources.

2. Pains: Pains are the key negative experiences, emotions, or risks that customers experience trying to accomplish their jobs. In the context of Horizon funded energy projects. This could include the complexities of managing energy consumption or the challenges in accessing reliable and green energy sources.

3. Gains: Gains refer to the benefits or outcomes that customers desire. This might encompass achieving energy independence, reducing carbon footprint, or enhancing corporate sustainability reputation.

Value Map

The Value Map focuses on the offering and how it addresses the customer profile. It too is divided into three parts:

1. Products and Services: This outlines the list of products and services that create value for the customer segment. For energy-related projects, this could range from innovative energy storage solutions to energy efficiency consultancy services.

2. Pain Relievers: These directly address how the product or service alleviates specific customer pains. A pain reliever might be a technology that simplifies the integration of renewable energy sources into existing infrastructure, thereby reducing operational complexities.

3. Gain Creators: These detail how the product or service enhances customer gains. An example might be a platform that not only facilitates the trading of renewable energy but also provides data analytics for better energy management, thus helping customers achieve their sustainability goals.

2.2.1 Value Proposition Canvas Example: Customer Profile for Energy Producers

Using the Value Proposition Canvas for our hypothetical local flexibility market for energy, we can detail the alignment between the market's offerings and the needs of its customer segments—primarily energy producers (including renewable sources) and consumers (both residential and commercial).

Customer Profile for Energy Producers

1. Customer Jobs: Maximising the profitability of energy production and finding reliable markets for excess energy.

Energy producers are focused on optimising their operations and revenue, indicating a need for flexible and accessible markets to sell their surplus energy.

2. Pains: Fluctuating demand for energy and limited direct access to local markets.

These challenges reflect the operational and economic uncertainties faced by producers, particularly those in renewable energy, underscoring the importance of stable and diverse market opportunities.

3. Gains: Stable revenue streams and partnerships with consumers and utilities.

For producers, the gains lie in achieving financial stability and building strategic relationships, pointing towards the benefits of a platform that facilitates such connections.

Value Map for the Local Flexibility Market

1. Products and Services: A digital platform for trading energy and services that enhance grid flexibility.

This offering directly addresses the customer jobs by providing a solution that enables easy access to renewable energy options for consumers and a reliable market for producers.

2. Pain Relievers: Simplifies the process of buying and selling renewable energy and offers tools for managing energy consumption efficiently.

By addressing these specific pains, the platform removes significant barriers for both consumers and producers, facilitating a smoother transition to renewable energy and more effective energy management.

3. Gain Creators: Enables consumers to achieve cost savings and contribute to environmental sustainability; provides producers with stable revenue opportunities and access to a broader market.

These gain creators directly enhance the desired outcomes for both customer segments, aligning with their economic and ecological goals, thus making the platform an attractive solution for their needs.

2.3 Other Business Model Examples

Innovations and trends in energy business models are reshaping the energy industry, driven by technological advancements, environmental concerns and changing consumer expectations. These shifts are paving the way for more sustainable, efficient, and customer-focused energy solutions. Below, we delve into some of the key innovations and trends currently transforming the energy business landscape.

Decentralisation and Distributed Energy Resources (DERs)

The shift towards decentralisation is characterised by the distribution of energy resources closer to the point of use. DERs, such as solar panels, wind turbines, and energy storage systems, allow households and businesses to generate their own electricity, reducing reliance on centralised power plants. This trend is facilitating greater energy democracy and resilience, enabling energy systems to better withstand disruptions.

Digitalisation and Smart Grids

Digitalisation is playing a crucial role in the transformation of energy systems. Smart grids use digital technology to monitor and manage the transport of electricity from all generation sources to meet the varying electricity demands of end users. The integration of advanced sensors, IoT (Internet of Things) devices, and real-time data analytics helps in optimising energy production, distribution, and consumption, enhancing grid efficiency and reliability.

Energy-as-a-Service (EaaS)

EaaS is an emerging business model where customers pay for an energy service without having to make upfront capital investments in energy assets. This can include energy supply, storage, and management services. EaaS models are gaining popularity among both commercial and residential customers, offering flexibility, cost savings, and access to the latest energy technologies.

Electric Mobility and Vehicle-to-Grid (V2G) Systems

The rise of electric vehicles (EVs) is not only transforming the automotive industry but also the energy sector. V2G technology allows EVs to return electricity to the grid during peak demand periods. This not only helps in balancing the grid but also allows EV owners to earn revenue by selling back excess energy stored in their vehicle's battery.

Renewable Energy Certificates (RECs) and Green Financing

RECs are market-based instruments that certify the bearer owns one megawatt-hour (MWh) of electricity generated from a renewable energy resource. This mechanism supports the growth of renewable energy by providing a way for businesses and individuals to offset their carbon footprint. Green financing, including green bonds and loans, is also growing, providing the necessary capital for renewable energy projects and other environmental initiatives.

Microgrids and Energy Storage

Microgrids are localised grids that can operate independently from the traditional, centralised electricity grid. This innovation is crucial for energy resilience, particularly in areas prone to natural disasters or in remote locations. Coupled with advancements in energy storage technologies, such as batteries and pumped hydro storage, microgrids can ensure a reliable energy supply even when disconnected from the main grid.

Blockchain for Energy Transactions

Blockchain technology is being explored for its potential to facilitate secure, transparent, and efficient energy transactions. It can be used for energy trading, managing RECs, and enabling peer-to-peer energy trading within microgrids, allowing consumers to sell excess energy directly to neighbours without the need for a centralised intermediary.

Net-Zero and Carbon Neutral Goals

An increasing number of companies and governments are setting ambitious net-zero or carbon-neutral goals. This trend is accelerating investments in carbon capture, utilisation, and storage (CCUS) technologies, renewable energy, and energy efficiency measures. It also fosters innovation in business models that prioritise environmental sustainability alongside economic growth.

These trends and innovations signify a transformative period in the energy sector, focusing on sustainability, resilience and consumer empowerment. The ongoing evolution of energy business models will continue to play a pivotal role in addressing global energy challenges, including climate change and energy access.

2.4 Technological Readiness Levels

Technological Readiness Levels (TRL) are not a business model tool itself, but a method for estimating the maturity of a product and its relation to the market, developed by NASA in the 1970s, and introduced by the European Commission in its research and innovation projects since H2020.[1]

In the energy sector, TRLs are particularly useful for assessing the development stage of new technologies, from conceptual ideas to market-ready solutions. Below we provide two hypothetical examples for each TRL, to illustrate their application in the energy sector and possible activities to increase the TRL level [2].

Table 1 Example of TRL applied in the energy sector

TRL	Definition	Examples	Activities	KPIs
1	*Basic Principles Observed*	• **Quantum Dots for Solar Cells:** Research into quantum dots suggests they could significantly increase the efficiency of solar cells, but practical applications are still theoretical. • **Artificial Photosynthesis:** Investigating the basic principles of	Conduct thorough literature reviews to understand current scientific research and potential applications. Initiate brainstorming sessions to identify possible	Number of potential applications identified. Completion of initial feasibility studies.

[1] Information available at https://horizoneuropencpportal.eu/store/trl-assessment

[2] For a detailed definition of TRL, please refer to the official European Commission definition provided in the Work Programme 2021-2022, General Annexes (European Commission Decision C(2022)2975 of 10 May 2022) https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-13-general-annexes_horizon-2021-2022_en.pdf

		using sunlight to convert water and carbon dioxide into fuel.	technology applications.	
2	*Technology Concept Formulated*	• **1. Solid-state Batteries:** Concept formulation for solid-state electrolytes to improve battery safety and energy density. • **2. Wave Energy Converters:** Early concepts of devices that can capture energy from ocean waves.	Design and perform preliminary experiments to validate the basic principles. Develop theoretical models to predict technology performance.	Number of successful laboratory tests. Accuracy of theoretical models compared to initial experimental data.
3	*Experimental Proof of Concept*	• **1. Perovskite Solar Cells:** Laboratory-scale experiments demonstrate higher efficiency potential compared to traditional silicon cells. • **2. High-temperature Superconductors:** Proof of concept for their use in energy transmission, reducing energy loss	Develop a detailed experimental design for more rigorous testing. Optimise the experimental setup to improve reliability and relevance.	Reduction in variance of experimental results. Increase in experiment repeatability.
4	*Technology Validated in Lab*	• **1. Bi-directional EV Charging:** Laboratory tests show that electric vehicles can return energy to the grid. • **2. Carbon Capture on Microalgae:** Lab	Scale up the laboratory setup to a pilot scale that mimics real-world conditions. Conduct validation tests in	Successful operation of the technology under simulated conditions. Achievement of predefined

		validation of microalgae's ability to capture carbon dioxide from flue gases.	simulated operational environments.	operational benchmarks.
5	*Technology Validated in Relevant Environment*	• **1. Smart Grid Technologies:** Testing of smart meters and grid management systems in pilot areas. • **2. Floating Solar Panels:** Validation in bodies of water that simulate real operational environments	Implement the technology in a real-world pilot project. Collect operational data and feedback from the pilot to inform further development.	Performance metrics from pilot projects (e.g., efficiency, reliability). Feedback satisfaction scores from operational staff or end users.
6	*Technology Demonstrated in Relevant Environment*	• **1. Geothermal Heat Pumps**: Demonstrated at a community scale to provide heating and cooling solutions. • **2. Hydrogen Fuel Cells for Transport:** Pilot projects showing the viability of hydrogen fuel cells in buses or cars under real traffic conditions.	Activities: Develop a full-scale prototype for extensive testing. Demonstrate the prototype in an operational environment for an extended period.	Achievement of target performance specifications in an operational environment. Number of operational hours without significant failure.
7	*System Prototype Demonstration in Operational Environment*	• **1. Offshore Wind Turbines:** Full-scale turbines installed at sea, showing viability in harsh weather conditions. • **2. Large-scale Battery Storage Systems:** Demonstrations of grid-scale battery storage managing energy	Finalise the design based on prototype testing feedback. Pursue and obtain necessary certifications and regulatory approvals.	Successful completion of certification processes. Compliance with all regulatory standards and requirements.

		loads and providing backup power.		
8	*System Complete and Qualified*	• **1. Advanced Nuclear Reactors:** Small modular reactors (SMRs) completing regulatory review and being ready for commercial deployment. • **2. Industrial Energy Efficiency Technologies:** Advanced heat recovery systems qualified for widespread industrial use.	Full commercial deployment of the technology. Continuous monitoring and improvement based on operational data and user feedback.	Market penetration rate. User satisfaction and reliability indices. Reduction in maintenance and operational costs over time.
9	*Actual System Proven in Operational Environment*	• **1. Photovoltaic Solar Panels:** Widely deployed in various climates, demonstrating long-term reliability and efficiency. • **2. LED Lighting:** Fully adopted in residential, commercial, and industrial settings, proving energy savings and performance over traditional lighting.	-	-

2.5 Customisable Templates

2.5.1 Business Model Canvas Template

Key Activities

Question	Details
What key activities do our value propositions require? Our distribution channels? Customer relationships? Revenue streams?	

Key Resources	
Question	Details
What key resources do our value propositions require? Our distribution channels? Customer relationships? Revenue streams?	

Value Propositions	
Question	Details
What value do we deliver to the customer? Which one of our customer's problems are we helping to solve? What bundles of products and services are we offering to each Customer Segment?	

Customer Relationships	
Question	Details
What type of relationship does each of our Customer Segments expect us to establish and maintain with them? Which ones have we established? How are they integrated with the rest of our business model? How costly are they?	

Channels

Question	Details
Through which Channels do our Customer Segments want to be reached? How are we reaching them now? How are our Channels integrated? Which ones work best? Which ones are most cost efficient? How are we integrating them with customer routines?	

Customer Segments	
Question	Details
For whom are we creating value? Who are our most important customers?	

Cost Structure	
Question	Details
What are the most important costs inherent in our business model? Which Key Resources are most expensive? Which Key Activities are most expensive?	

Revenue Streams	
Question	Details
For what value are our customers really willing to pay? For what do they currently pay? How are they currently paying? How would they prefer to pay? How much does each Revenue Stream contribute to overall revenues?	

2.5.2 Value Proposition Canvas Template

Customer Segment	
Aspect	Details
Customer Jobs: What tasks are your customers trying to perform? What problems are they trying to solve? What needs are they trying to satisfy?	
Pains: What negative experiences, emotions, or risks do your customers fear? What are the biggest challenges and frustrations they face?	
Gains: What outcomes and benefits do your customers expect? What would make them happy and what are their aspirations?	

Value Map	
Aspect	Details
Products & Services: What products and services do you offer to each Customer Segment?	
Pain Relievers: How do your products and services alleviate customer pains? What specific pain points are you addressing?	
Gain Creators: How do your products and services create customer gains? What makes your offer desirable to your customers?	

3. Three Examples on Energyrelated Business Models.

Below are three examples of business models related to the energy sector from literature. They can serve as a pathway to delve deeper into the topic, concepts, the technical language in the energy sector and possible business models. To explore additional business models, you can search the BRIDGE repository and use the collective knowledge among the BRIDGE members.

3.1 V2G:

The report "Creating Value from V2G[3]" by Laura Jones, Kathryn Lucas-Healey, and Björn Sturmberg, focuses on developing business models for V2G services, offering a comprehensive analysis based on interviews with experts in the energy and transport sectors. It explores V2G's potential to provide services directly to the energy system, contrasting it with Vehicle to Home (V2H) services. The document details the complexities of implementing V2G, including the unique business models for intermediaries who facilitate these services between EV owners, grid operators, and market participants. It underscores the importance of differentiating business models to capitalise on V2G technology and addresses technical, commercial, and social scepticism surrounding V2G intermediaries. You can access the full report here.

3.2 Microgrids:

The report "Emerging Microgrid Business Models"[4] by Peter Asmus Mackinnon Lawrence explores the evolution of microgrids from pilot projects to mature technologies with a focus on innovative business models driven by advancements in energy storage and regulatory flexibility. It highlights the diversity of microgrid applications and the significance of business model innovation for market growth, emphasising the need for adaptable strategies to meet various market demands. The report outlines ten distinct business models, ranging from facility owner financing to public-private partnerships, each catering to specific market segments like commercial, military, and remote communities. It discusses the critical role of technology, particularly control systems, in ensuring the viability and success of microgrid projects, while also acknowledging the challenges of bankability and replicability across different market segments. The report concludes that no single business model will dominate the industry, which is diverse in its applications and geographical presence, suggesting a future where multiple models coexist and evolve in response to market and regulatory developments. You can access the full report here.

3.3 Demand Response Business Model:

The study Demand Response Business Model Canvas[5]: by Michael Hamwi, Iban Lizarralde, Jérémy Legardeura is a tool for flexibility creation in the electricity markets. It introduces a framework for demand response business models (DRBMs) to enhance energy flexibility affordably and sustainably. The framework, derived from literature and a case study, includes nine elements ranging from product flexibility to revenue models, and proposes a visualisation tool for understanding and developing flexible electricity products, with EVs as an illustrative example. This tool aims to assess the potential for demand response in electricity markets, contributing a comprehensive approach to fostering business models in evolving energy sectors. It can be accessed here.

[3] Creating value from V2G A report on business models Laura Jones, Kathryn Lucas-Healey, and Björn Sturmberg September 2022
[4] Emerging Microgrid Business Models Peter Asmus Mackinnon Lawrence Principal Research Analyst Senior Research Director Published 1Q 2016
[5] Demand response business model canvas: A tool for flexibility creation in the electricity markets
Author links open overlay panel, Michael Hamwi, Iban Lizarralde, Jérémy Legardeur, 2020.

4. Risk Management and Mitigation Strategies

As with any development, there is always risk involved during the development of products and services. As the maturity of the innovations grows, so does the need to safely and accurately allocate resources to the right type of activities that pursue the development whilst minimising risks. Essentially, we want to strive to develop products, services and features that end customers want and are willing to pay for and minimise development on products, services and features that customers do not want and / or are not willing to pay for.

One tool to assess the risks related to a specific business model or KER is the table presented below. The degree of the importance of the risk related to the final achievement of the KER (1 low – 10 high) and the probability of the risk happening (1 low – 10 high) are analysed. A potential intervention is proposed as well as the feasibility/success of the intervention (1 low – 10 high). The risk grade refers to the mean for each category and is calculated the following way (degree of importance * probability of risk happening/number of identified risks). This number is then multiplied by the success of the intervention, leading to the priority level.

The risks are then categorised into risks where no action is required, where the risk is controlled, where action is needed and when there is a warning.

	Key Exploitable Results	Degree of importance of the risk related to the final achievement of KER	Probability of risk happening	Risk Grade	Scope and type of potential intervention	Feasibility/Success of Intervention	Priority Level
1	**Partnership Risk Factors**	*0*	*0*	**0**		*0*	**0**
2	**Technological Risk Factors**	*0*	*0*	**0**		*0*	**0**
3	**Market Risk Factors**	*0*	*0*	**0**		*0*	**0**
4	**IPR/legal Risk Factors**	*0*	*0*	**0**		*0*	**0**
5	**Financial/management Risk Factors**	*0*	*0*	**0**		*0*	**0**
6	**Environmental/regulatory Risk Factors**	*0*	*0*	**0**		*0*	**0**

The priority map in turn shows the outcome of the risk analysis in order to gain a graphical perspective on what risks that should be prioritised over others.

Outcome

Figure 1: Priority map in turn

5. Regulatory and Environmental Considerations

5.1 Navigating Legal Frameworks

Navigating legal frameworks within the energy industry is essential for businesses. The sector faces a complex web of local, national, and international regulations that address issues ranging from energy production and distribution to environmental protection and consumer rights. Understanding and navigating these legal frameworks are essential for compliance, risk management, and strategic planning. Below, we present several aspects of legal frameworks within the energy industry and strategies for effective navigation.

This guide doesn't look at specific policies but rather provides an overview of what type of policies and regulations that one might need to investigate in order to fully understand the global, regional and local contexts.

1. Environmental Regulations

Environmental regulations address the impact of energy production and consumption on air, water, and soil. These include emissions standards, waste management requirements, and regulations on the use and disposal of hazardous materials. But also, regulation on farmland, crop production, municipal veto powers, building permits and more. Companies must stay informed about environmental legislation in every jurisdiction they operate in, ensuring compliance and integrating environmental stewardship into their business practices.

2. Energy Production and Distribution Laws

Laws governing energy production and distribution may vary between countries on specifics, such as concession rights for grid ownership, and regions, covering aspects such as the licensing of energy facilities, grid access and the regulation of utilities. Understanding these laws is critical for operational planning and for negotiating contracts and agreements related to energy production and distribution.

3. Renewable Energy Policies and Incentives

Many states within the EU and globally offer incentives for renewable energy development, such as tax credits, subsidies and feed-in tariffs. These policies aim to encourage investment in renewable energy projects and technologies. Businesses need to stay abreast of these incentives to capitalise on them effectively and to align their investment strategies with policy objectives and these may change from year to year in EU member states and countries abroad.

4. International Energy Agreements

International agreements and treaties can have significant implications for the energy sector, particularly in areas like trade, emissions reductions, and technology transfer. Companies operating internationally must understand how these agreements affect their operations and strategic opportunities, especially in the context of global efforts to combat climate change.

5. Energy Market Regulations

Market regulations influence the competitive landscape of the energy sector, including rules on market access, competition, and pricing. These regulations aim to ensure fair competition, protect consumers and maintain energy security. Navigating market regulations is essential for strategic positioning and for advocating for regulatory changes that support business objectives.

6. Strategies for Effective Legal Navigation

Staying Informed: Keeping up-to-date with legal developments through legal counsel, industry associations, and regulatory bodies.
Compliance Programmes: Developing comprehensive compliance programmes that include training, monitoring, and auditing practices.
Stakeholder Engagement: Engaging with regulators, policymakers, and other stakeholders to understand regulatory trends and advocate for favourable policies.
Legal Expertise: Leveraging in-house legal expertise or consulting with external legal advisors specialised in energy law.
Navigating the legal frameworks within the energy industry requires a proactive and informed approach. By understanding and effectively managing legal and regulatory risks, companies can enhance their operational efficiency, mitigate risks, and seize opportunities for growth and innovation.

6. Emphasising Sustainability in Business Models in the Energy Context

Emphasising sustainability in business models within the energy context is increasingly becoming a central strategy for companies aiming to contribute to environmental stewardship while ensuring long-term economic viability. This shift towards sustainable practices is driven by global challenges such as climate change, resource depletion and societal expectations for responsible environmental behaviour. Sustainable business models in the energy sector focus on reducing carbon footprints, enhancing energy efficiency, and promoting renewable energy sources, among other strategies. Below, we explore key components and strategies for integrating sustainability into energy business models.

1. Renewable Energy Integration

Companies are increasingly investing in renewable energy sources such as wind, solar, hydro, and biomass to power their operations. This not only helps in reducing greenhouse gas emissions but also in securing long-term energy supply and price stability. Renewable energy integration is facilitated by technological advancements, decreasing costs, and supportive regulatory frameworks.

2. Energy Efficiency Measures

Improving energy efficiency across operations is a core strategy for sustainable business models. This includes optimising industrial processes, upgrading energy-efficient equipment, and adopting smart building technologies. Energy efficiency not only reduces energy consumption and costs but also minimises environmental impact. This can have a positive impact on the types of financial instruments that will be available to a company, e.g. green loans.

3. Circular Economy Practices

Incorporating circular economy principles, such as recycling, reusing, and reducing waste, into business models can significantly enhance sustainability. In the energy sector, this could involve the recycling of materials used in renewable energy installations and batteries, extending the lifecycle of energy products, and designing products for easier end-of-life recycling.

4. Carbon Pricing and Trading

Adopting carbon pricing mechanisms and participating in carbon trading markets are ways companies can internalise the cost of carbon emissions. This encourages investment in cleaner energy sources and technologies. Carbon trading also allows companies to meet emission reduction targets cost effectively through the purchase of carbon credits.

5. Sustainable Supply Chain Management

Ensuring that supply chains are sustainable is crucial for minimising the overall environmental impact. This involves selecting suppliers based on their environmental performance, using sustainable materials and promoting energy efficiency throughout the supply chain.

6. Regulatory Compliance and Beyond

Complying with environmental regulations is the minimum requirement; leading companies go beyond compliance by setting more ambitious internal sustainability targets. This proactive approach often involves setting net-zero carbon goals, investing in nature-based solutions, and leading industry-wide sustainability initiatives.

By integrating these strategies into their business models, companies in the energy sector can contribute significantly to the global transition towards a more sustainable and resilient energy system. The focus on sustainability not only addresses environmental and societal challenges but also offers businesses a competitive advantage through innovation, risk management, and alignment with evolving regulatory and market dynamics.

7. Pitching an Idea

Pitching is a critical component in the development of ideas, primarily because it facilitates clarity in communication and provides valuable insights into customer responses. During the pitching process, presenting an idea to potential customers allows for immediate feedback regarding what aspects are appealing and comprehensible, as well as what elements are confusing or unappealing. This feedback is essential for refining the idea, as it highlights the components that customers find attractive and are willing to pay for and identifies areas that require further clarification or adjustment. Additionally, pitching can reveal underlying assumptions that may need re-evaluation based on customer reactions, thus ensuring that the idea is both marketable and aligned with customer expectations. Furthermore, the process of articulating the idea in a clear and structured manner can help in

identifying and addressing potential weaknesses or gaps in the concept, ultimately leading to a more robust and well-defined product or service.

There is largely no substitute for customer engagement. The process of pitching is experience building and forces one to reach beyond the immediate circle of partners within the project to external stakeholders with little to no prior knowledge of the ideas and concepts being developed and as such, provide real world feedback on the innovations developed within BRIDGE. There is also no valid excuse to avoid pitching from an early start as technical development is not needed for pitch an idea. Pitching should not wait for product development, rather, product development should wait for the outcomes of pitching to guide development into product, services and features. In other words, pitching helps obtain feedback about how to alleviate customer pains, enhance expected gains and solve real issues that the customer is willing to pay for.

7.1 The NABC Method

The Need, Approach, Benefit and Competition (NABC) pitching model is a framework developed by the Stanford Research Institute to assist in defining and presenting ideas, The NABC model is particularly valued for its simplicity and focus. It compels you to think critically about all key aspects of your pitch, ensuring that you cover the essential information in a manner that's easy for your audience to grasp and remember. Your NABC should evolve as you refine your idea and gather more information.

- **Need**: This aspect requires you to identify and articulate the specific need or problem that your idea or project aims to address. It's about understanding and explaining who has this need, how significant the problem is, and how frequently it occurs.

- **Approach**: Here, you describe how you plan to meet the identified need or solve the problem. This involves outlining your proposed solution or method in a way that's understandable and convincing.

- **Benefit**: This section is about the advantages or value that your idea brings. You need to clarify the benefits of your solution, not just in general terms but specifically how it improves upon current solutions or addresses the need in a more effective way.

- **Competition:** This involves understanding other existing solutions or approaches to the same problem and explaining what sets your idea apart—its unique selling points or competitive advantages.

8. Conclusion and Future Outlook

During the work for Task 1 in the BRIDGE Business Model Development Working Group, we have noticed that the business model tools used in the different stages of member projects are similar. However, knowledge about these tools and the activities related to them can vary somewhat, which has prompted us to produce this guide on the "fundamentals".

There are, of course, more advanced and specific models but in essence they follow the same type of logic, language and approach as the standard Business Model Canvas and Value Proposition Canvas. These two models are therefore the cornerstone of business model development and can be used by BRIDGE projects in their business and exploitation activities.

While this guide offers an introduction to business models, you are encouraged to draw on the wealth of knowledge and insights available within the BRIDGE community.

List of References

1 Information available at https://horizoneuropencpportal.eu/store/trl-assessment
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