Vanguards and ventures: Projects as vehicles for corporate entrepreneurship

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Abstract

The concept of vanguard project refers to a first-of-its-kind project, initiated to enable a firm to diversify into a new market or technology based on an existing market and client base. We show that the concept can be broadened by engaging with the corporate entrepreneurship literature, which demonstrates that many entrepreneurial projects for diversification are developed in areas where there is no existing client and a market has to be created. The paper makes the unconventional connection between the literature on project business, and studies of entrepreneurship using two examples from the UK energy sector to illustrate how firms develop vanguard projects where there is no existing client. In both cases, the firms used vanguard projects to venture into new technologies or markets, to generate new knowledge and experience rather than to optimise an existing activity. However, the learning from a vanguard project may not always lead to a general scaling up or rolling out process across a number of new similar projects through applying the lessons learned in the new venture. Future research on vanguard projects should embrace both the responses to existing client needs and internally generated initiatives to create entirely new markets.

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1. Introduction

This paper explores the relationship between the notion of vanguard projects and strategies for corporate entrepreneurship.

Researchers have recognised that, at some point in time, large well-established firms face the difficult choice of continuing to develop the capabilities supporting their existing business or creating new sources of competitive advantage by moving into new technologies and markets [30,25]. Many firms have grown successfully by improving their understanding of current customers’ requirements and integrating existing technologies into their new products [40]. However, the introduction of radical change – or ‘breakthrough innovation’ – in a product’s design or purpose can threaten an established firms’ hitherto successful business [11]. In this paper, we analyse the specific organisational form that firms often employ to act as an entrepreneur, in order to break away from their rigid core capabilities and build new ones by diversifying into new markets and technological fields [22].

Given the uncertainty involved in moving into uncharted territory and recognising or pursuing an opportunity [5] a project organisation is frequently the instrument used by firms to investigate departures from a firm’s current technology and market ([48, p. 164]). Accordingly, we argue that some projects due to their inherent flexibility and speedy adaptiveness represent the organisational vehicle involved with the development of capabilities [20].

There is an increasing number of studies devoted to how firms use projects to improve the performance of existing
activities and move into new innovative lines of business [32,45] projects are temporary, flexible organisations used to:

- achieve sustained competitive advantage through the exploitation of already established resources and capabilities. This entails administrative management of projects that is adaptive and responsive to the environment;
- explore new ways to develop competitiveness by venturing into new markets and aiming for the frontier of technology to search for, discover and test new opportunities. This implies entrepreneurial management of projects that are pioneering and leading [24].

Davies and Hobday [14] distinguish between two main types of projects. Building on Penrose’s [37] original analysis, the firm base refers to activities undertaken in existing markets and familiar technologies. A ‘base project’ is undertaken to meet current customer demands for an existing range of products and services. A ‘base-moving project’ is a novel initiative that recombines resources in order to search, discover and test new market opportunities and/or experiment with new technologies. Davies and Hobday [14] use the term ‘base-moving project’ to emphasise the process of capability building that takes place when a firm learns to develop or adopt new technologies, or to respond to or create new markets.

Employing the concept of base-moving strategies, Brady and Davies [7] present a model of project-based learning that occurs when firms move base into new technologies and markets. Whereas a firm can initiate several base-moving projects as part of a strategy of diversification, Brady and Davies [7] identify a ‘vanguard project’ as the first project to be launched in a deliberate effort to move away from a firm’s core business activities and venture into a new market or technology base. The word vanguard serves as a useful metaphor for conveying how a project can be positioned in advance of the rest of the organisation and at the forefront of innovation.¹

A careful review of Davies and Hobday [14], therefore, reveals that there is a need to clarify the precise difference between the concepts of base-moving and vanguard projects. A vanguard project is a subset of base-moving projects. It should be interpreted as the first in what may turn out to be part of a series of base-moving projects to enable a firm to diversify into a technology or market position. However, a vanguard project may not lead to successful move into a new base, although it may generate useful knowledge for future vanguard projects. In some cases, the core business of the firm is founded upon the use of vanguard projects to create a continuous stream of unique products and experiences for clients, as in the example of the design practices like the architect Frank O. Gehry [6].

The concept of vanguard project is useful because it encompasses some of the organisational characteristics of these first-of-their-kind base-moving projects. A vanguard project is an effective mechanism for ‘testing opportunities’ as well as mobilising and integrating dispersed specialised knowledge residing within or outside the boundaries of the firm. It is motivated by the need to generate learning, information and the creation of new knowledge in an effort to develop or renew the capabilities of the firm. Therefore, vanguard projects are central for understanding the dynamics of capability changes over time and through events [22].

However, in our view, the concept of vanguard project is often too narrowly defined. Brady and Davies [7] assume that a vanguard project is established to respond to the changing requirements of existing customers; such projects are novel because they are highly customised to pre-existing clients [38], and, therefore, the innovation that occurs in these projects is often client-driven. This interpretation does not address the situation in which a vanguard project is established to create a customer or market for an entirely new product or service, or to search for and test a potential opportunity. Projects undertaken purely to search and build a new market or test a recognised opportunity, we label entrepreneurial acts [44]. Like vanguard projects developed with a client, project ventures are experiments and must cope with the uncertainties of an unknown ‘solution space’² [15]. Yet, the conditions of high demand uncertainty [27] are different, since there is no client involved and the outcome of the project venture is not secure in terms of return on investment.

There are existing project management tools and techniques for dealing with existing technologies and customer requirements and a well-known set of uncertainties within the solution space [42]. Gantt charts will identify key issues such as planning, prioritising and sequencing of activities in order to achieve efficiencies. However, these traditional types of project management tools often perform poorly when faced with unforeseen uncertainties that, by their nature, cannot be dealt with at the outset [15], because these types of tools have been developed to manage cost, time and quality objectives, rather than learning and innovation. The corporate entrepreneurship literature provides useful insights into how firms strategically develop novel initiatives and ventures to cope with unforeseen uncertain-

¹ According to the Chambers English Dictionary (1988), a vanguard means ‘the forefront: those who lead the way or anticipate progress’.

² The notion of a ‘solution space’ refers here to the range of potential solutions to a problem or potential problems that might be recommended or defined before undertaking the actual task at hand. Knight [27] calls this risk rather than uncertainty because the solution space may contain unknown aspects, but the general list of variables is relatively well-known and the uncertainties relate to those variables defining the solution space and not to a discussion about the variables or about the general solution aimed at. Von Hippel and Katz [49, p. 826] in discussing the solution space state that “Economical production of custom products and services is only achievable when a custom design falls within the pre-existing capability and degrees of freedom built into a given manufacturer’s production system”.

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ties [8,48] and to develop experience to inform future choices related to capability creation and evolution.

The literature on business projects has developed significantly since the mid 1990s through the linking by researchers of concepts from the project management literature with strategic management studies, organisational economics as transaction cost economics and innovation theories. In the context of an emerging entrepreneurial economy [2], we believe that the marriage of vanguard projects and corporate entrepreneurship research could benefit both fields equally. The entrepreneurship perspective is useful for increasing understanding about the variety and function of organisational designs associated with vanguard projects and understanding the emergence of firm capabilities.

This paper is organised in four sections. The main part of this conceptual paper is Section 1, which establishes the conceptual background to our argument. It discusses the role of projects as vehicles for diversification focusing on vanguard projects and corporate venture initiatives. It suggests that the concept of a vanguard project should be extended to include contributions from the corporate entrepreneurship literature. This integrated approach is illustrated in Section 2 through two short examples from the UK energy sector. Section 3 discusses how these two examples relate to the theoretical framework. Section 4 concludes by proposing new directions for future research on project business and entrepreneurship.

2. Projects as vehicles for diversification: towards an integrated approach

This section introduces the concept of vanguard project and discusses the way that the corporate entrepreneurship literature highlights how projects are used as ventures. It advances the view that the concept of vanguard project should be extended in order to address its role in ventures to create new markets.

2.1. The project as a vanguard

There are numerous definitions of the project [18] and especially how the concepts of projects and business link to each other [1]. However, there is wide agreement that a project is distinct from the routine tasks involved in the high-volume production of standardised goods and services. A project involves complex, non-repetitive tasks and results in unique or highly customised output. Projects are temporary organisations involving teams of individuals from within a single firm or from multiple firms. A project performs a time-sequenced set of interdependent activities to achieve pre-defined goals or conform to specifications, within a precise budget [31]. Projects are initiated to accomplish tasks that do not occur sufficiently often to warrant the establishment of an enduring organisation [47] or because it is not economically efficient to bring together diverse and highly specialised resources on a permanent basis. Many projects are organised between suppliers and clients through the institution of the market, while others arise within firms to meet internal objectives [29]. Finally, as emphasised by Kreiner [28] all projects encounter uncertainties both internally with regard to organisation, governance and communication, and externally in terms of how they cope with emergent events and other unforeseen challenges.

Projects initiate innovation in two ways. First, as the literature on new product development shows, firms in all types of industries use projects to make incremental improvements to existing products and to initiate radical breakthroughs in products that incorporate new technologies [50]. Development projects that create prototype products and services for a ‘virtual client’, concentrate on achieving design freeze prior to market introduction and production of the new product in large volume. Second, firms in project-based industries initiate the process of diversification through the establishment of a project. In the extreme cases of music and film making, each project results in an entirely new product, and film reels and CDs are produced in large quantities.

Brady and Davies [7] developed a conceptual model of project capability building in the capital goods industries, in which process diversification begins with the creation of a vanguard project. This new type of project organisation is developed specifically to experiment with and learn from a new technology and to explore novel market opportunities. In vanguard projects where the degree of change is extensive, managers cannot rely on their existing experience and approaches. They need to develop new capabilities to manage bids, execute the project and integrate the new technologies into products or systems. Furthermore, since the notion of vanguard project underlines the elements of learning, exploration and even discovery of novel opportunities, it suggests that within these projects, special managerial attention should be paid to ongoing reflection, promotion of doubt and constant questioning and a relative openness and acceptance of major changes in scale and scope or even early termination of a project [19].

Brady and Davie’s [7] model incorporates two co-evolving levels of learning. First, the bottom-up process of learning, which begins with an initial phase when the vanguard project is set up to explore the new opportunity. Vanguard projects are distinct from projects focused on achieving operational excellence in a firm’s existing market or technology base. While current operational projects focus on efforts to improve efficiency, vanguard projects are established to promote radical or breakthrough innovation in products, processes and services. In the project-to-project learning phase, attempts are made to capture experience gained in the initial phase (i.e. learning what) and transfer it to other projects. In the project-to-organisation learning phase, attempts are made to develop the capabilities and resources to deliver a growing number of these new types of project. This involves the transfer of practices related to managing vanguard projects (i.e. learning how).
Second, top-down learning in which senior management in the firm monitor the vanguard and subsequent projects and, if the firm is successful in the markets, puts in place, company-wide, the capabilities and resources needed to focus activities on the new opportunity. A vanguard project is used by large firms to develop and test emerging technologies and markets to achieve the basis information for the more encompassing strategic decision to move base. This is realised oftentimes by scaling up a successful vanguard project to a permanent business unit or model responsible for delivering a large number of slightly similar projects.

Brady and Davies [7] focus on vanguard projects that are initiated to respond to the demands of existing customers, articulated, for example, in invitations to tender or in close dialogue. Although these projects are novel for the firm, they are designed to satisfy a client’s pre-determined specifications and thus could be regarded as an extreme form of customisation. We suggest that a vanguard project can be initiated as the autonomous endeavour of a supplier or even a client. In this case, there are no existing customers and the project is aimed at an emerging market or one to be created. This is a different type of project because the product development phase is a relatively discrete act that does not involve dialogue with customers. In this case, the vanguard project is a corporate venture initiated under the firm’s own volition. For example, below we describe how one firm established a vanguard project to build and operate a plant using a specific number of interdependent energy-efficient, carbon-neutral, novel technologies. The aim of the project was to search for new opportunities, develop some preliminary capabilities in a new but related business area and generate experience and information that would inform subsequent strategic decision making about whether the firm should build a portfolio of similar sized plant operations using the same or a combination of technologies. In this instance, the vanguard project was being used to test new technologies (the qualities of the gas and hydrogen produced) under operating conditions and to create important operational knowledge prior to a move to high-volume production for a specific plant and setting, and a number of new plants.

We argue that some vanguard projects serve as an initial corporate entrepreneurial device for responding to and creating innovation in technologies and markets. They are used by large firms as ‘mechanisms to redefine and rejuvenate themselves, their positions within markets and industries, or the competitive areas in which they compete’ ([13, p. 47]). Such projects are a strategic tool for developing and reconfiguring the firm’s capabilities [39].

2.2. The project as a venture

The classical entrepreneurship literature focuses on the development of radical new knowledge embodied in new products and services, which causes creative destruction in the established market [4,41]. This view is complemented by entrepreneurship research that argues that real novelty (i.e. technological change) is not needed to spur entrepreneurial action. Kirzner [26] maintains that acquiring information and learning, and being alert to market trends is enough to lever entrepreneurial activities that yield increased opportunities and potentially profits.

We suggest that the recent body of literature on corporate entrepreneurship helps to demonstrate how firms use projects to identify and test opportunities and create new markets, rather than simply respond to customer-generated initiatives for change. According to Burgelman [9] corporate entrepreneurship describes the process whereby firms engage in diversification through internal development. Corporate entrepreneurship extends ‘the firm domain of competence and corresponding opportunity set through internally generated new resource combination’ ([9, p. 154]).

The concept of corporate entrepreneurship departs from the classical entrepreneurship literature in its signifying that it is the firm – rather than the individuals – that behave entrepreneurially. Like individuals, firms may engage in different forms of (corporate) entrepreneurship to achieve a variety of objectives, in which the management of risk and uncertainty is a key challenge.

2.2.1. How to organise corporate entrepreneurship activities

We argue that corporate entrepreneurship refers to at least four key ways that firms proactively interact with the environment:

- by creating spinouts;
- by investing externally;
- by engaging in alliances and joint ventures;
- by launching and managing internally-based vanguard projects.

A firm must decide which of these four options will best achieve its entrepreneurial objectives. In this paper, we focus on firms’ use of projects as an entrepreneurial vehicle for venturing into new markets or technologies.

2.2.2. Strategies of corporate entrepreneurship

The literature on corporate entrepreneurship suggests four main strategies. Covin and Miles [13] state that the most common form of corporate entrepreneurship is ‘sustained regeneration’, involving the continuous introduction of new products aimed at the same or similar markets, and involving largely similar families of technologies, to achieve competitive differentiation. As a corporate entrepreneurship strategy, this approach incurs very low risk.

‘Corporate rejuvenation’ refers to the ways in which firms seek to sustain or improve competitive advantage by altering internal processes, structures and capabilities [46]. It does not necessarily imply a change in product, strategy or brand and often involves chasing efficiencies through realising scale or scope economies. This strategy shares some similarities with the activities involved in pro-
cess innovation and, according to Covin and Miles [13], appears a more uncertain strategy than sustained regeneration.

A third form of corporate entrepreneurship is described as ‘strategic renewal’. This is more radical in that it redefines the firm’s relationship with its markets or its position in the industry, thus jeopardising its current position in terms of market segment and brand. For example, Harley Davidson, the US motorcycle manufacturer, achieved strategic renewal when it changed from being a traditional American biker-favoured motor cycle producer to becoming a niche supplier offering superior quality, excellent service and increased responsiveness to customers’ product requirements [36]. This type of corporate entrepreneurship is often based on alertness to market trends, rather than to supply side changes in terms of products and services.

Finally, corporate entrepreneurship can entail ‘a redefinition of the industry domain’. This implies a change to the rules of the game through the promotion of radical innovation. Corporate entrepreneurship of this kind is rare. Prominent examples include the development of the Sony Walkman and the Apple iPod, both of which products provided first mover advantages and an initial period of domination in completely new markets. This interpretation of corporate entrepreneurship is clearly linked to supply side changes. For example, the corporate innovation project to develop the iPod was not undertaken in collaboration with a client, and was for Apple, but did involve a radical move into a new technology and a new market base.

Several scholars have examined how large incumbent firms use projects as a vehicle to support corporate entrepreneurship [8,21,24,25]. Large firms, such as General Electric and IBM, have used internal corporate venturing (ICV) projects to initiate organic growth and diversification. In a process of organisational growth and maturity, an individual ICV project can grow into a sizeable and separate new business. ICV projects constitute an important source of renewal for established firms. Burgelman’s study of a high-volume producer looked at how ICV projects grew into new businesses based on new technology. These projects linked technological possibilities to new or poorly served market needs [9], and instead of being a top-down initiative, were initiated by middle-mangers who often encountered senior management resistance to their proposals and projects, which went against conventional corporate wisdom and current strategies.

Burgelman’s study of ICV projects demonstrates how fast growth towards a sizeable business organisation depends on functional efficiency gains obtained by ‘the development of routines, standard operating procedures and the establishment of an administrative framework for the new venture’ ([9, p. 38]). Galbraith’s [21] model of venture start-ups and growth shows how firms evolve through distinct phases from initial business ideas (embodied in a vanguard project) towards high-volume production. This process of capability development and scaling up is similar to the model of capability building proposed by Brady and Davies [7]. However, whereas in ICV projects (in Burgelman’s study and Galbraith’s model) the move from initial project to high-volume production depends on strong functional capabilities (e.g. manufacturing and distribution), a vanguard project moves to a higher volume stage based on the delivery of repeated base-moving projects, and depends on strong project management capabilities.

Kanter [25] distinguished between two generic types of projects: mainstream projects, which are performed to meet a firm’s current business commitments, and newstream projects, such as an ICV, which are entrepreneurial initiatives designed to explore new business opportunities. Firms are confronted with a balancing act between maintaining the momentum of their mainstream activities, and starting newstream ventures that will create future business. When industry conditions are relatively stable, managers will often display a preference for a predictable mainstream project; in more turbulent environments managers may be more willing to embark on a project that is outside the traditional scope of the firm’s business. The creation of a new business usually starts with the establishment of a newstream project that moves quickly into a new market space, such as initial project to design the IBM Personal Computer, which was brought to market in 1981.

Corporate entrepreneurship can be implemented as a top-down initiative or can occur as a bottom-up, autonomous process. Corporate entrepreneurship is sometimes a strategic choice [13] that may be made as a result of a high-profile, strategically important project, such as a cross-functional product development team, a technology incubator, or a skunk works operation. However, corporate venture projects can often arise from numerous small projects and seed-bed initiatives scattered throughout the organisation, each requiring only a few resources [3]. Over time, such bottom-up newstream projects may become part of the mainstream and be supplemented and substituted by a smaller number of larger projects, making more systematic use of corporate-wide resources.

2.3. Vanguard and venture projects: towards an integrated approach

Our review of the corporate entrepreneurship literature suggests first that relative little attention has been paid to the analytical level of the project vis-à-vis the firm or the individual. Second, and more important here, it also suggests that a vanguard project is not just as an innovative response to the needs of existing customers, but should also be understood as a novel entrepreneurial venture to create new markets encompassing new customers. A vanguard project can be set up as an innovative response to an existing customer, but can also be generated internally by a firm seeking to exploit a new entrepreneurial opportunity beyond its traditional base or in emerging markets.

A vanguard project can be recognised as an entrepreneurial venture to reduce uncertainty through the gathering of information and experience to enable more informed
judgments and decisions about future investments in new technologies and markets [10]. There are two main reasons for organising innovative activities in vanguard projects. First, it may be a strategic decision to reduce the risks in exploiting new opportunities, by recombining or adapting existing resources, knowledge, mind sets and technologies to suit the new problems and situations. Second, it may enable the testing of opportunities to connect with novel technologies, new partners, and new market activities in adjacent industries.

All projects incur degrees of uncertainty. Similar to Cohen and Levinthal [12] two faces of uncertainty, we suggest that vanguard projects have to cope with two categories of uncertainty:

- Operational uncertainty – inherent in the internal management of aspects such as team dynamics, skills, pre-determined product features, deadlines, etc., i.e. internal project factors;
- Environmental uncertainty – the relationship between a project and its external environment, such as wider market demand, technical change, and how the knowledge generated by individual projects can be transferred to other projects or organisational levels within the firm.

Mainstream projects face fewer uncertainties because the solution space of the project is relatively well known. There is uncertainty in mainstream projects, but it is confined to a number of established variables. Traditional project management tools are based on the premise that a project can be worked out as rational planning process. Minkler [34] calls this parametric uncertainty as it involves altering certain product dimensions within a stable framework, to meet changing consumer demands. It typically does not involve new organisational capabilities since the solutions to a particular problem can be confined to a set number of optional variables.

A vanguard project represents a firm’s endeavours to overcome the increased uncertainties in newstream projects. Here, the traditional planning tools used to manage projects are no longer useful because the core intention of the vanguard project is learning and exploration, rather than achievement of efficiency and a pre-determined goal. This relates to Minkler [34] structural uncertainty, which refers to the more open-ended process of selecting from many possible solutions in order to solve a complex problem. Vanguard projects have to cope with the introduction of new variables and emergent events during project execution. Structural uncertainty in vanguard projects can result in the reorganisation of industries and substantial changes to the types of firms that constitute them.

A selectionist, trial and error approach is particularly useful when a firm launches a vanguard project to develop a new and complex product incorporating new design features and technologies. This process of iterative learning is focused on problem solving throughout the project, and capturing learning rather than implementing known techniques. The selectionist approach also suggests that initially a number of alternative vanguard projects could be run in parallel (i.e. base-moving projects), in order to decide which to terminate and which to continue. This project portfolio approach aimed for vanguard projects only is a costly strategy, however, and risks several projects competing for scarce resources [51].

Vanguard projects focused on emerging markets with no pre-identified customers, often require firms to make changes to their capability base. However, vanguard projects may also be used to implement a brand change, as a re-branding tool it can change perceptions of the firm’s capabilities and also indicate the firm’s strategy and future development direction. For example, Enron strategically used a number of succeeding vanguard projects to change its image of a fuel and gas company to achieve wider recognition as an electricity supplier [33]. The cases described in Section 3 demonstrate that vanguard projects can be used to change the firm’s capabilities and to change the firm’s brand at a more discursive level. For example, BP uses a combination of vanguard projects and the development of new business units (e.g. BP Alternative) to signal its move ‘Beyond Petroleum’.

Finally, the original conception of vanguard projects [7] emphasises response to customer demands and learning, to achieve the advantages of repeatable solutions. However, supply-driven vanguard projects may not necessarily result in replicable solutions or even to greater monetary profit. Rather this type of vanguard project may be initiated as an entrepreneurial venture for learning, capabilities development and exploring opportunities for radical change. A vanguard project may be terminated after a test run, and only a few of the stylised facts and knowledge captured may be exploited as guidelines in subsequent vanguard projects. By incorporating the notion of venturing into our expanded definition of vanguard projects we want to address the many different ways that projects can be set up to explore and exploit emerging innovative opportunities, which involve the prior creation of a market or customer base.

3. Illustrative examples

We provide brief illustrative examples [43] of two projects in the UK energy sector in order to add to our understanding of the nature and purpose of a vanguard project. These cases are both exploratory and not intended as comparisons, but rather are used to highlight specific features of the vanguard project phenomenon. The examples are based on secondary data sources, analysed through desk research.

The examples involve two large incumbent energy generators and suppliers. The firms – RWE npower and BP – sought to develop and change their capability profiles and brand images by moving into more energy efficient and carbon-neutral technologies, such as wind power generation and carbon storage. Both firms established van-
guard projects to explore these departures from their traditional base in the energy industry.

The cases differ in terms of the technology involved: wind turbine array (npower) and carbon dioxide storage and hydrogen generation (BP), but both are situated in the energy sector and have similar goals. Both firms used vanguard projects as an entrepreneurial strategy to explore the performance of new technologies and to test new market options and, thus, employed vanguard projects as test beds for diversification into renewables in the energy sector.

Energy suppliers are being faced with managing a balance between carrying out mainstream projects to preserve their sunk cost investments and increasing the efficiency of fossil fuel technologies, and launching a vanguard project to explore the radical option of moving into renewable or carbon-neutral technologies. There are huge uncertainties about the feasibility and reliability of renewable technologies for large-scale electricity supply as well as about which renewable technologies might prevail and be cost efficient. Market turbulence creates uncertainties about the most suitable business model for energy efficiency and delivery of low-carbon energy to end consumers. For example, it raises questions about how much vertical integration is useful and which parts of the industry should be integrated to create and deliver the product (i.e. energy) and related services (i.e. distribution, maintenance, retail, etc.) [23]. This context makes the energy industry a convenient setting to illustrate our argument.

3.1. The wind turbine case: npower Renewables’ North Hoyle offshore wind farm

RWE npower, one of the UK’s leading energy companies, generates and sells electricity using sustainable, environmentally-friendly resources. npower’s parent firm RWE npower performs all operational and routine activities. npower Renewables develops, installs and finances projects designed to improve energy efficiency and maintenance costs for facilities. It has a wide ranging portfolio of projects, such as onshore and offshore wind farms, a hydroplant and a biomass plant which are operated by RWE npower. As the UK government’s policy is to achieve a target of 10% of electricity from renewables by 2010, npower’s strategy is to be at the forefront of this production.

The first case study is npower Renewables’ North Hoyle offshore wind farm project. North Hoyle was one of the first-round designs and the first site to actually be constructed. It comprises 30 Vestas V80 wind turbine generators each capable of generating up to 2 MW providing a total installed capacity of 60 MW – enough electricity for some 40,000 homes. Its output offsets an annual release of about 160,000 tonnes of CO₂. The North Hoyle wind farm is situated 7–8 km off the coast of North Wales at a depth of 7–11 m, with a tidal range of 8 m. It covers an area of 10 km². Connection to the grid system is at Rhyl via two 33 kV cables. The project’s final cost was £81 million; it received a grant from the then Department of Trade and Industry in the UK, of £10 million (North Hoyle Wind Farm Annual Report 2004/05, accessed online 15 August 2007).

North Hoyle can be seen as a vanguard project because it was established not only to generate energy, but also to serve as a platform to increase learning about the construction of wind farms in the UK. It involved a partnership between npower (lead partner) and Greenpeace (a non-governmental organisation – NGO) in the development of ‘npower juice’, a ‘clean’ electricity product available to domestic customers at the same price as traditionally produced electricity. Prior to its development no such energy product existed on a large scale in the UK; it was uncertain whether demand could be created and whether the energy from North Hoyle could be sold through the existing channels. North Hoyle therefore is a vanguard in terms of both its technical achievements, which will yield crucial information for future wind farms in the UK, and in terms of its business model (i.e. NGO involvement) and the sale of its green energy project at no extra cost to consumers, which highlights the market and organisational changes that this project represents. At the opening at the North Hoyle wind farm, Stephen Tindale of Greenpeace, commented that: ‘This pioneering windfarm will lead the way towards...bigger developments in UK waters that we so urgently need to help tackle global warming...The first turbine installed at North Hoyle represents a crucial milestone on the road to clean energy in the UK’ (npower Renewables homepage accessed 15 August 2007).

The npower parent firm uses vanguard projects to develop the firm’s capabilities in handling and exploring new technologies and new combinations of technologies, as well as larger scale energy projects. These projects are often organised through a particular business unit with specialised capabilities in initiating and governing uncertain projects. npower is attempting through its vanguard projects to establish and promote the firm’s environmentally-friendly brand and capabilities and thus consolidate its current competitive advantage in carbon-neutral energy generation.

As the first major offshore wind farm in the UK, North Hoyle was a groundbreaking project; it represented a learning curve for npower and the other parties involved. North Hoyle has been operating successfully for over two years with an impressive efficiency of 95%. Lessons learnt from the design and build phases and its two years of operation, have been fed back into the development of npower Renewables’ Rhyl Flats wind farm, which is a bigger project currently in the tender evaluation phase. The experience of designing and operating the North Hoyle windfarm will reduce uncertainty and anticipate a number of the problems involved in the initiation of other wind farm projects around the UK. npower Renewables has a second-round offshore wind farm, Gwynt y Mor (a 750 MW project) in the advanced development phase, awaiting approval. The North Hoyle vanguard project
provided valuable information which enabled the scaling up in the plans for the Rhyl Flats plant.

3.2. The carbon dioxide storage case

BP is one of the world’s largest energy companies. Its main activities are oil and gas exploration and production, refining and marketing oil products, and transportation and marketing of natural gas and power. Its low-carbon power business, BP Alternative Energy, is involved in hydrogen power, photovoltaic power, wind power and natural gas-fired power generation. BP also has extensive experience in pipelines and the management of oil and gas in geological formations, power generation and petrochemicals operations.

Exploring collaborations with partners from other parts of the energy sector, such as Scottish and Southern Energy (SSE) is an example of BP’s interest in partnering with others in the energy sector. A joint energy service company (e.g. ESCO) was developing a project involving the design and construction of the world’s first industrial scale venture to generate ‘carbon-free’ electricity from hydrogen. The project was a so-called Carbon dioxide Capture Project (CCP) and was located close to Peterhead in north-east Scotland. A newly built reformer plant would convert up to 70 million cubic feet of natural gas a day into carbon dioxide and hydrogen.

The planned project to produce ‘decarbonised’ fuel and use it at the site of production for power generation would convert natural gas to hydrogen and carbon dioxide gases, use the hydrogen gas as fuel for a 350 MW combined cycle gas turbine power station, and export the carbon dioxide to a North Sea oil reservoir for increased oil recovery and ultimate storage. The project would reduce the amount of carbon dioxide emitted to the atmosphere through alternative power generation by over 90%. While each of the component technologies that make up the project is already proven, their combination proposed in this project would be a world first.

According to BP, this project would ‘represent a significant new step in providing clean energy to consumers, tackling carbon dioxide emissions believed to contribute to climate change and enhancing the recovery and utilisation of known world energy resources’ (BP Alternatives, web site, accessed 10 August 2007). This can also be seen as a vanguard project because it combines existing and novel technologies within a completely new plant for exploitation existing resources, using fossil fuels and hydrogen power generation.

In 2007 BP was completing initial project engineering feasibility studies and detailed front-end engineering design work in order to identify the economic feasibility of the scheme. The final investment decision was to be made in 2007, subject to which the project should commence operation in 2009. Yet, due to various factors among them BP’s interpretation of lack of political support the project was terminated after its design and scoping phase.

The project would have required total capital investment of some $600 million. It would have required an appropriate policy and regulatory framework to encourage the capture of carbon from fossil fuel-based electricity generation and its long-term storage. When fully operational, the scheme was expected to capture and store around 1.3 million tonnes of carbon dioxide per year and provide ‘carbon-free’ electricity to the equivalent of a quarter of a million UK homes.

The project was located in the BP Alternatives division and aimed specifically at changing the BP product portfolio to meet the challenge of a zero carbon economy. BP was therefore investing in continuous/high-volume production of energy through renewable technologies, such as hydrogen, wind and solar power. However, certain projects are being launched to test the technologies, the performance and market aspirations before rollout of similar plants around the world. This project reflects BP’s engagement in transforming itself from a company involved in fossil fuels to a multi-product firm involved beyond petroleum in the energy sector. In particular BP is interested – in the short-term (2–7 years) – in power generation, and in the longer term (10–20 years) in power transmission, distribution and direct end user sales possibly through, or in combination with, more distributed systems (i.e. Combined Heat and Power). Lord Browne, former BP Group Chief Executive, said:

‘This is an important and unique project configured at a scale that can offer significant progress in the provision of cleaner energy and the reduction of carbon dioxide emissions’ (BP website, speeches 2007, accessed July, 2007).

The benefits of exploiting learning from a vanguard project to develop large-scale business were clearly spelt out by Lord Browne: ‘For example, if applied to just 5% of the new electricity generating capacity that the world is projected to require by 2050, such schemes would have the potential to reduce global carbon dioxide emissions by around 1 billion tonnes a year – a material step in the challenge the world faces. The success of this UK scheme will provide invaluable experience for the further application of this concept worldwide’ (Ibid.). In the UK, and Scotland in particular, the project would have provided a new, large-scale source of decarbonised electricity for consumers and extend the commercial life and contribution of the North Sea to the UK and the Scottish economies. For BP the project would have enabled: ‘opportunities to replicate this

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While this paper was being developed BP decided to terminate the design and planning of this vanguard project mainly because of difficulties between BP and the UK government over time schemes, etc. However, the lessons learnt by BP in the design and development of this project have been assimilated and the company is currently embarking on projects in the US and in Australia, both with local partners. Neither of these projects has pre-established clients.
scheme and apply the associated technologies and experience in other parts of the world where we conduct business’ (Ibid.).

4. Discussion

These two examples show that vanguard projects are not always established in response to customer demand, but can be the result of a corporate entrepreneurial strategy to create a new venture where a customer base must be created or is emerging. This type of vanguard project meets Christensen’s [11] strategic advice to be wary of being always led by the demands of customers. These types of vanguard projects are newstream corporate ventures. They do not fit with the use of traditional management tools aimed at more administrative and routines-based project activities. The vanguard projects launched by npower and BP are means of achieving the corporate entrepreneurship objectives of learning and testing rather than simply optimising in terms of creating efficiencies. As mentioned by Dess et al. [17] such activities can be seen as a mix of corporate entrepreneurship strategies including strategic renewal, development of sustained regeneration through the introduction of new products within the same industry domain, and corporate rejuvenation. But, neither of the projects described here has redefined the industry domain and/or changed the rules of the game in the energy sector.

Both these cases suggest that large firms in the energy sector may employ vanguard projects to create a novel demand market and to test out technological options before venturing into larger scale investment. The cases also demonstrate that vanguard projects are not simply about developing new knowledge and capabilities, but are also about creating new brand image. This is because both these vanguard projects are ingredients in strategies that are not solely related to introducing more environmentally-friendly products developed by the efforts of the project, but are also part of an effort to reposition the two companies – npower and BP – within the energy industry through the achievement of a different brand profile for their parent companies. This process, taking place over a series of base-moving projects, can be considered an example of corporate rejuvenation, as discussed in the corporate entrepreneurship literature.

As our examples illustrate, vanguard projects have to deal with many different types of uncertainties and unforeseen risks. Although npower’s wind farm project was technologically challenging, key issues in the vanguard project were the partnership with Greenpeace and the development of a market for ‘clean’ energy, while the BP project faced major uncertainties in terms of technologies, but the demand market uncertainties were relative low.

Traditional models of capability development in the firm strategy literature do rarely include the role of project organisation in the development of new technological skills [22,35]. In the two examples in this study the project management capabilities of the daughter-organisations were necessary to infuse novelty into the core business processes of the parent firms. In both cases the vanguard projects were executed by launching an entrepreneurial project-based venture to generate a new capability base for the firm. This supported the firms’ strategies of diversification.

5. Conclusion

The concept of a vanguard project originally developed by Brady and Davies [7] refers to a first-of-its-kind project initiated to diversify into a new market or technology for existing clients or markets. From our review of the corporate entrepreneurship literature it emerged that many entrepreneurial ventures aimed at diversification are developed through projects where there is no existing client base and a market has to be created. DeFillippi and Spring [16] employ the adjacent notion ‘project entrepreneurs’ to describe this phenomenon. Their insight combined with our illustrative cases suggests that future research on vanguard projects should embrace responses to existing client needs and internally generated entrepreneurial initiatives to create entirely new markets.

We recommend that future theoretical research on how firms use projects to diversify and build capabilities would benefit from integrating ideas and perspectives from the literature on corporate entrepreneurship. We suggest that vanguard projects are used as ventures for generating a new resource base; however, further research is needed to examine the organisational process of how the integration and reuse of project outcomes translates into the project routines of the parent company.

Previous literature on project business has emphasised the importance of incorporating research from the mainstream management literature including the theory of the firm, business strategy, organisational studies, new product development and innovation management [52,1,45]. However, very little of the project business literature has engaged with the field of entrepreneurship, which occupies a central place in the research areas listed above. Our efforts to expand the definition of vanguard projects are a first step in this direction. Clearly more research is needed to incorporate the corporate entrepreneurship literature into project business research.

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