



# Evolving theories of sustainability and firms: History, future directions and implications for renewable energy research



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## ABSTRACT

Sustainability has become a critical perspective in managing firms via a holistic approach by considering economic, environmental and social dimensions of firms. With the rising significance of sustainable development, the theories of sustainability in firms have evolved during the past six decades. This article offers a critical review of the evolving theories linking sustainability to firms, and discusses their implications for future renewable energy research. The relationships among different theories are critically analysed, and the directions for future research are discussed. The paper shows that, the main theories linking sustainability to firms, in a chronological order, are: 1) Corporate Social Responsibility, 2) Stakeholder Theory, 3) Corporate Sustainability, and 4) Green Economics. Currently various innovative approaches and new theories emerged, such as Co-evolution Theory and Multi-level Perspective, reflecting three directions of theory development, namely 1) shifting from “what” to “how”, 2) growing use of interdisciplinary approach, and 3) towards broader systems. Renewable energy studies associated with firms and future research opportunities in this area are also critically analysed. The comprehensive review offered in this paper provides a useful reference for policy makers, corporate managers and researchers interested in corporate sustainability and renewable energy related studies.

## 1. Introduction

Since the release of the *Brundtland Report* in 1987, the concept of sustainable development has been playing a critical role in policy making [1,2]. Sustainability of firms has become an important research area since firms are the productive resources of the economy. Without support from firms, sustainable development could not be achieved [3]. Firms play a crucial rule in facilitating sustainable development.

As a coherent description or explanation of phenomena, theories explore why and how acts, events, and thoughts occur [4–6]. Thus, theories play a significant role in human inquiry which helps to understand, describe, explain, and predict phenomena. Sustainability consideration in managing firms emerged in the 1930s, far before the release of the *Brundtland report* [7]. Since then, sustainability-related thinking of firms has evolved and a number of theories have been proposed and continue to emerge that explore the complex interrela-

tionships between sustainability and firms. These theories include: Corporate Social Responsibility, Stakeholder Theory, and Corporate Sustainability. This reflects enormous efforts as well as research opportunities in this field. Since so many theories have emerged, future endeavour in this field needs to be based on clear understanding of the interrelationships amongst the evolving theories. However, this has yet been adequately explored by existing studies.

The application of renewable energy makes a significant contribution to the sustainability of our planet. Renewable energy studies associated with firms have received growing attention from scholars. This is because renewable energy needs to be popularized in industries to generate large-scale impacts, which is equally important to the technical aspects. However, there is a lack of studies that critically analyze this strand of research.

This paper presents a critical review of the evolving theories on sustainability and firms, and discusses potential future directions of

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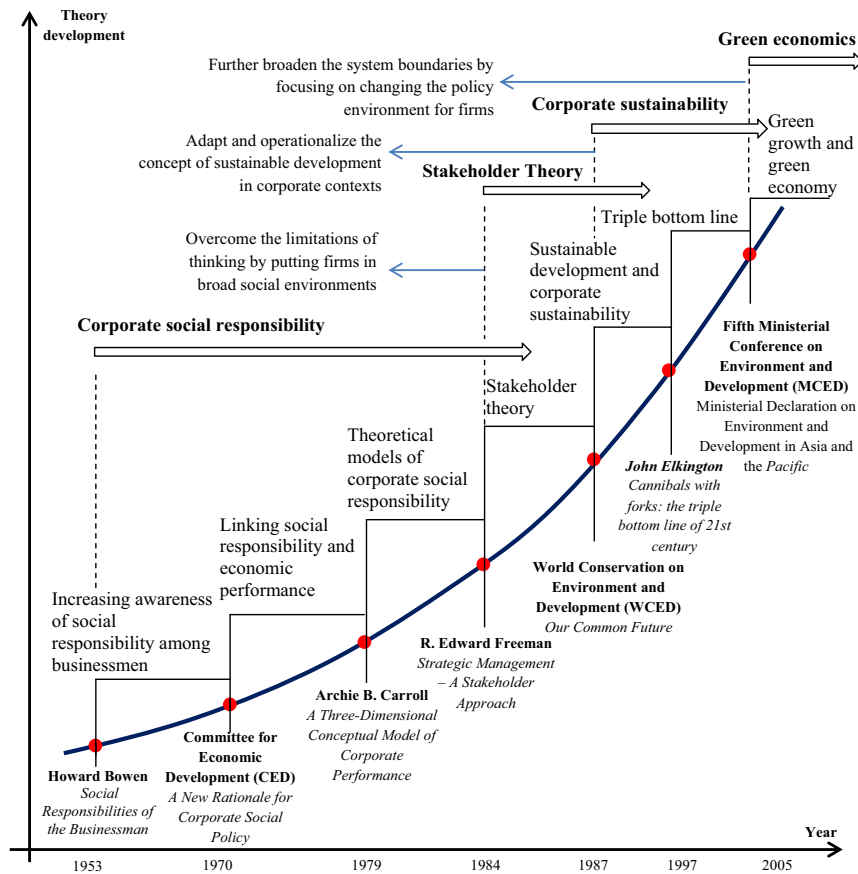
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**Table 1**  
Representative definitions of “sustainability” and “sustainable development”.

Definitions	Source
• “development which meets the needs of the present without compromising the ability of future generations to meet their own needs”	World Commission on Environment and Development [12]
• “sustainability is the ability of a human, natural or mixed system to withstand or adapt to endogenous or exogenous change indefinitely”	Dovers and Handmer [13]
• “sustainability is a relationship between dynamic human economic systems and larger dynamic, but normally slower-changing ecological systems, in which (a) human life can continue indefinitely, (b) human individuals can flourish, and (c) human cultures can develop”	Costanza [14]
• “improving the quality of human life while living within the carrying capacity of supporting eco-systems”	Munro and Holdgate [15]
• “sustainable development involves the simultaneous pursuit of economic prosperity, environmental quality and social equity”	Elkington [16]
• “sustainability is an economic state where the demands placed upon the environment by people and commerce can be met without reducing the capacity of the environment to provide for future generations”	Hawken [17]



**Fig. 1.** Milestone documents and evolving theories explaining sustainability and firms.

theory development. Consequently, a theory landscape is developed, illuminating the future research opportunities in the field of sustainability and firms. Similarly, this paper offers insights on the future research opportunities associated with renewable energy and firms.

## 2. The concept of sustainability

Sustainable development can be traced back to the concept of sustainable societies which appeared in 1974 [8]. It was brought to the mainstream politics by the *Brundtland Report* [9]. However, the definition of sustainability in the *Brundtland Report* is relatively vague which underlies complexities of sustainability [10]. The vagueness of the concept, combined with its growing level of importance in national and international policy-making, has led to an extensive debate and a wide variety of definitions [1,2]. There are approximately three

hundred definitions of “sustainability” and “sustainable development” [11]. Some of the typical definitions are summarized in Table 1.

All these definitions emphasize that sustainability concerns promote the indefinite existence of human systems. In order to achieve that, a balance is required between the carrying capacity of eco-system and the human economic and social systems. It is widely recognized that there are three dimensions of sustainable development, i.e. the economic, social and environmental dimensions [16]. To achieve the vision of sustainability, some international political agendas are in place. As the outcome document of the World Summit on Sustainable Development, the *Johannesburg Plan of Implementation* identifies three overarching objectives, of essential requirements for sustainability worldwide, i.e. “1) poverty eradication, 2) changing unsustainable patterns of production and consumption, and 3) protecting and managing the natural resource base of economic and social develop-

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