

CHAPTER 1 INTRODUCTION AND THEORETICAL 13

1-1 Introduction "Due to the importance of thin film compounds in many practical applications, we study materials like thin film Cadmium sulphide (CdS). This compound holds significance in various technological advancements, particularly in the realm of renewable energy." Cultural shifts towards sustainability, environmental stewardship, and renewable energy adoption are becoming increasingly prevalent [7]. In conclusion, the history and culture of energy illuminate the intricate connections between human societies, technological advancements, and the natural environment. The harnessing of water and wind energy marked significant milestones in the history of energy usage, enabling communities to expand agricultural production and industrial activities [2].

1-2-2 Medieval and Renaissance Periods: During the medieval and Renaissance periods, advancements in technology led to the utilization of water wheels and windmills for grinding grain, pumping water, and other mechanical tasks.

14 1-2-5 Modern Energy Landscape: In the 20th and 21st centuries, the energy landscape has become increasingly diverse, with the emergence of oil, natural gas, nuclear power, and renewable energy sources such as solar, wind, and hydropower. Technological advancements have expanded the possibilities for energy production, distribution, and consumption, leading to debates about sustainability, environmental impacts, and energy security [5]. There is growing recognition of the need to transition towards cleaner, renewable energy sources and promote energy efficiency and conservation measures. The development of electric generators, transmission systems, and electrical appliances revolutionized industries, communication, and domestic life. Energy-rich societies have seen the emergence of consumer culture, leisure activities, and lifestyles dependent on energy-intensive technologies [6].

1-2-1 Ancient Civilizations: Early human societies relied on renewable energy sources such as biomass (wood, animal dung) and muscle power (human labor, animal labor) for their survival. The rise of coal mining and industrialization profoundly transformed societies, leading to the emergence of new social classes and labor movements [3]. Electricity enabled the widespread adoption of electric lighting, electric motors, and eventually, electrified transportation [4].

1-2-6 Cultural Perspectives: Energy has also influenced cultural expressions, artistic movements, and societal values. Understanding the past and present dynamics of energy usage is crucial for addressing the challenges and opportunities that lie ahead in building a sustainable energy future. From ancient times to the modern era, energy has played a pivotal role in shaping societies, economies, and cultures around the world. Ancient cultures often revered natural elements such as the sun, wind, and water, recognizing their importance as sources of energy [1]. The invention of the steam engine fueled by coal ushered in an era of unprecedented industrial growth and urbanization. Coal became the dominant energy source, powering factories, transportation, and urban infrastructure. These civilizations developed agricultural practices, built structures, and engaged in trade and commerce driven by the energy available to them.

1-2-3 Industrial Revolution: The Industrial Revolution, beginning in the late 18th century, marked a profound shift in energy usage.

1-2-7 Challenges and Opportunities: Today, the world faces complex challenges related to energy sustainability, climate change, and access to energy resources.

1-2-4 The Age of Electricity: The late 19th and early 20th centuries saw the advent of electricity as a transformative energy source. Literature, art, and cinema often reflect themes related to energy, technology, and the human relationship with nature.

1-2 The History and Culture of Energy The history and culture of energy

are deeply intertwined with the development and progression of human civilization. 1–3 What is energy?