

Chapter 5

A Road Map for a Domestic Wind Turbine Manufacturing Industry in Turkey

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ABSTRACT

Climate change is now widely recognized as the major environmental problem facing the globe. In large part this is due to emissions of so-called “greenhouse gases,” which mainly result from the production of energy using fossil fuels. In addition to environmental problems, some countries with limited fossil fuel reserves also suffer from energy-dependency. Turkey, for instance, now imports over 90 percent of its oil and natural gas at an annual cost of approximately US\$35 billion. Turkey’s dependence on imported energy portends negative effects on both national security and the economy. More investment in renewable energy has thus become vital. In this context, wind energy appears not only to be the most cost-efficient, medium term solution for energy dependency, but also for global climate change mitigation. Wind energy has the potential to reduce environmental impacts because it does not generate either atmospheric contaminants or thermal pollution. It also makes economic sense because while the costs of most forms of energy are rising, the costs of wind energy are decreasing. This chapter explores the way in which a strong domestic wind turbine manufacturing industry can be nurtured in Turkey. For this purpose, the chapter focuses particularly on some key measures such as investment subsidies, tax exemptions, corporate financing schemes, and information dissemination.

1. INTRODUCTION

The last four decades of the 20th century have been marked by profound industrial growth, which has elevated the overall socio-economic positions of many people. However, the long-term and indirect

negative impacts of this growth including climate change, global warming, loss of biodiversity, desertification and other environmental ills, are now increasingly being felt.¹ The world is getting hotter, and weather patterns have become more volatile and more extreme while the severity of

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weather-related disasters has escalated. The scientific consensus is that human-induced Greenhouse Gas (GHG) emissions are the primary cause of global warming and that carbon dioxide is the most important of the anthropogenic GHGs. Human activities are adding CO₂ to the atmosphere far faster than natural processes can remove it. Emissions have been, and continue to be, driven by economic growth. There has been a strong correlation between CO₂ emissions per head and Gross Domestic Product (GDP) per head. The energy sector is by far the biggest source of these emissions. Thus, global climate change mitigation is one of the most significant agendas that the human race will face in the coming decades.

Concern about climate change and rising concentrations of CO₂ in the atmosphere has stimulated the search for alternative energy resources. One approach is to switch from fuels with high carbon content per unit of energy, such as coal and oil, to those with lower carbon content, such as natural gas; however, there are limits to such substitutions. Another alternative is to shift away from fossil fuels to renewable energy resources (Benitez *et al.*, 2008: 1973). If we are to tackle climate change successfully, it is clear that we need to move away from burning limited fossil fuel reserves and towards more sustainable and renewable sources of energy.

Of the renewable options, wind power appears to be the most important and cost-efficient medium term solution to the problem of climate change and energy security. The generation of electricity by wind energy has the potential to reduce the environmental impacts caused by use of fossil fuels, because, unlike fossil fuels, wind energy does not generate atmospheric contaminants or thermal pollution. It also makes clear economic sense, because while the costs of most forms of energy are rising, the costs of wind energy are decreasing.

Nations around the world continue to develop economically. This fact has inevitably resulted in a constantly increasing demand for energy. Hence,

many countries and sub-national governments seek only to expand their domestic use of renewable energy, but also to develop accompanying local renewable energy technology manufacturing industries to serve that demand. Local wind technology manufacturing may be driven by policy support or by other factors, such as the regional advantages that come from labor and technological expertise which can facilitate learning networks. In this respect, this chapter focuses exclusively on the policy mechanisms that governments have at their disposal to encourage wind manufacturing localization.

The body of this chapter is organized as follows: The next section introduces key concepts and discusses the environmental and economic benefits of generating electricity from wind energy. The subsequent section outlines and examines the policy challenges to creating a low-carbon economy and the policy issues involved in promoting wind energy. The fourth section seeks an answer to the question: “How can Turkey rapidly deploy and develop wind energy while also reducing the economic, social, and environmental risks?” The concluding section discusses some of the implications for the design of a policy for Turkey.

2. SUSTAINABLE DEVELOPMENT AND THE SOCIO-ECONOMIC BENEFITS OF WIND ENERGY

Scientific evidence points to increasing risks of serious, irreversible impacts from climate change associated with the business-as-usual paths for emissions. Climate change threatens the basic elements of life for people around the world: access to water, food production, health, and use of land and the environment (Stern, 2006). Accelerating the development of new low-carbon technologies and promoting their global application are key challenges in stabilizing atmospheric GHG emissions (Dechezleprêtre *et al.*, 2011). Sustainable development requires a sustainable supply of clean

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