# How ambitious can the Israeli Green Deal be?

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# Abstract

# Israeli policy makers are considering carbon reduction targets for 2050. The goal of this study is to provide a comprehensive, economy-wide analysis of the alternative pathways for energy-related carbon emission reduction in Israel. An integrated bottom-up, top-down modeling exercise, based on an original MESSAGEix-IL-MACRO framework, was performed over the Israeli energy system to assess the cost-effectiveness of greenhouse gas (GHG) emissions reduction options—firstly with renewable energy and transport electrification targets, and secondly by imposing a carbon tax. The results show that, by the adoption of such a policy or a more ambitious policy (with a higher carbon tax), energy-related GHG emissions could be reduced by about 60% or 90%, respectively by 2050 relative to the reference year of 2005, with only a minor impact on the growth of the national gross domestic product (GDP). Decarbonization of the Israeli economy will necessarily be based on increasing the electrification of transport and industry and on generating power from renewable energy resources (mainly solar). The unique challenge for Israeli policy makers is a population growth rate that is unprecedented in the developed world. The infrastructure should be developed rapidly to keep the growth of the standard of living intact. This challenge also presents the opportunity for a quick transition to a cleaner economy. The modeling tool and its outcomes can provide valuable insights for the design of clean energy policies that permit the fostering of sustainability targets. This methodology results in various scenarios that may help decision makers to understand the options available to them to accomplish the ambitious goals and targets they may set in their political forums.

***Keywords***: carbon emission reduction, 2050 goals, linked bottom-up-top-down modeling

# Introduction

 The energy sector in Israel is at a crossroad. Traditional energy sources are in the process of replacement by natural gas (NG) and renewable energy (RE) in power generation, and industry and transport are being gasified and electrified. Long a resource-poor country, Israel now has more NG than it needs for the next thirty years. As Israel's energy bill before the NG discoveries was about $10 billion—more than 5% of GDP—the supply of domestic NG and its export have been contributing to the country's trade balance (Palatnik, Tavor, and Voldman, 2019).

Ultimately, the process is expected to lead to cleaner energy and a better environment. However, concerns about energy reliability and security, the intermittency of RE, and uncertainty about the costs of energy transition and required infrastructure challenge policy makers in committing to the transition.

Globally, smarter technologies and designs that use energy more efficiently could provide the same or better services with far less energy, costs, and risk (Gielen et al., 2019). Moreover, the fossil fuels that provide most of the energy now generally cost more than the modern renewable sources that have already taken over two-thirds of the world’s power-plant market (IEA, 2017).

Recent years have seen tremendous turmoil in regional and global energy markets, with volatile oil prices, geopolitical tensions over oil and NG supply, and tightened environmental regulation.

Those transformations offer remarkable opportunities for policy makers to build a durable economy and to make energy supplies resilient to catastrophic interruptions of supply. Evidence is now emerging in such major economies as China, India, the USA, and the EU that, if based on the lowest-cost available resources, ambitious global climate protection can be profitable rather than costly (NDRC, 2016; Kemfert, 2017; CCC, 2019).

The national carbon mitigation goals for 2050 should be declared at the United Nations Climate Change Conference (UNFCCC COP 26), to be held in Scotland in November 2020. The EU has recently stated ambitious targets of net zero carbon emissions to be reached by the year 2050 (European Commission, 2019). The Israeli policy makers are skeptical as to how far greenhouse gases (GHGs) emissions reduction in Israel can go without hampering economic growth. The aim of this study is to investigate the economic impact of alternative paths for GHGs emission reduction in Israel.

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