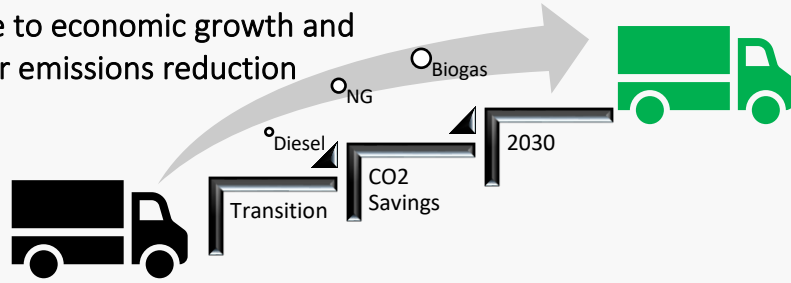


Natural gas value to economic growth and potentials for emissions reduction



Exploring natural gas consumption (NGC) as one of the potential sources of alternative energy is important as it proves as a more environmentally friendly alternative to traditional sources of energy such as petrol and diesel. This proliferation will only increase with increasing integration of biogas into the natural gas supply network.

With an existing natural gas supply network for electricity generation in most European countries, there is an increasing call for transportation to benefit from these networks. The relationship between gas consumption and economic growth is thereby explored for the 10 largest natural gas vehicle (NGV) markets in Europe.

A central focus of this study is driven by Ireland, a country that uses a large share of its natural gas for electricity generation but is on route to developing a NGV market. Ireland is therefore included in the country selections along with UK as its major gas importing partner.

The natural gas uptake differs significantly across EU countries, with the consumption rate further being affected differently after the 2007 global crisis. To establish the natural gas value to economic growth nexus, the presence of a bidirectional relationship between NGC and four variables of interest (i) real GDP, (ii) gross fixed capital formation, (iii) labour force, and (iii) trade openness, is investigated.



Establishing the presence of growth hypothesis → Gas consumption unidirectionally causes economic growth.

Investigated through 4 variables

Countries considered: Italy, Germany, Bulgaria, Sweden, Czech Rep., France, Switzerland, Netherlands, Austria, Hungary, Ireland and UK.

Aim
 Explore natural gas consumption (NGC) as one of the potential sources of alternative energy. Determine its linkage to economy and impact for policy awareness.

How has the usage of gas-based energy proliferated Europe over the past two decades ?

Concentration of natural gas vehicle (Fig.1) and station (Fig.2) population for top 10 European markets in 2016. [Source](#)

What are the dynamics of natural gas consumption to economic growth, especially for its largest consumers ?

Figure 1: Natural gas vehicle population for top 10 EU



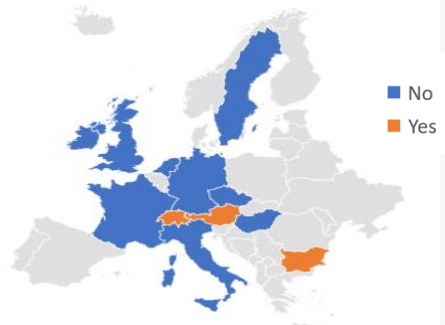
The relationship was assessed with panel data from 1991-2016 and based on the neoclassical growth model that incorporates natural resources into economic growth model. Findings presented evidence of a long-run co-movement between the four variables, and a long-run impact on economic growth between NGC and the four variables. These confirm the existence of growth hypothesis in the long-run for the 12 countries.

Figure 2: Natural gas vehicle station population for top 10 EU



The short-run relationship dynamics between NGC and economic growth did not produce strong results. The data presented evidence of short-run significant influence of NGC on gross fixed capital formation. Other than this, NGC seems to be a relatively independent phenomenon for the countries considered. It was found to be independent of economic growth, gross fixed capital formation, the labour force and trade openness.

Figure 3: Gas consumption causes real GDP growth (test 1)



Lastly, the results confirm the existence of a unidirectional relationship between economic growth and the four other variables considered. Real GDP has a causal impact on both gross fixed capital formation and the labour force, while no evidence of the reverse was found. Findings present an avenue for policy considerations. See the [full article](#):

Figure 4: Real GDP causes gas consumption (test 2)



Fadiran, Gideon, Adebisi T. Adebusuyi, and David Fadiran. "Natural gas consumption and economic growth: Evidence from selected natural gas vehicle markets in Europe." *Energy* 169 (2019): 467-477.