Imperial College London

Prof Niall Mac Dowell FRSC FIChemE

Centre for Process Systems Engineering
Centre for Environmental Policy
Imperial College London

Tel: +44 (0)20 759 49298
Email: niall@imperial.ac.uk

September 26th, 2023

Re: proposal by CERC to couple Indian Energy Exchange Ltd. (IEX), the Power Exchange of India Ltd. (PXIL) and the Hindustan Power Exchange Ltd. (HPX).

Dear Sir or Madam,

I am writing this in response to the call for comment on the above-mentioned staff paper.

My name is Niall Mac Dowell, I am a Profess of Future Energy Systems at Imperial College London. I am writing this letter in a personal capacity, without any specific agenda, beyond a general interest in ensuring the widest access to energy by the greatest number of people at the lowest possible cost. It is clear to me that achieving these goals means continuing to build upon India's impressive progress to date in this space, and continuing to ensure that India remains an attractive destination for foreign investment.

The "Staff Paper on Market Coupling" (the paper) published by the staff of the Central Electricity Regulatory Commission (CERC) identifies price differences in the day ahead market across the different exchanges for the same month for the period July 2022 – March 2023, and appears to attribute this price differential exclusively to the fact that there are multiple exchanges.

This price differential would appear to be inequitable to the consumers of power, i.e., Indian citizens and businesses, who are arguably being unreasonably penalised through no fault of their own, simply by virtue of their location.

It is demonstrated in Figure 1 of the paper that more than 99% of the DAM, GDAM, and RTM transactions occur on the IEX, with the Term Ahead Markets (TAM and GTAM) being more evenly distributed across IEX and PXIL with HPX commanding the smallest share.

As a remedy, it is proposed that market coupling would address this via increasing liquidity and supports this by comparison against the European experience.

As observed in the paper, market coupling in Europe dates back to 2006. However, at this point is important to note that "ever closer union[1]" is a key pillar of European policy since the 1957 Treaty of Rome, and has been retained and reenforced in, *inter alia*, the 1983 Solemn Declaration on European Union, the 1986 Single European Act, the 1992 Maastricht Treaty, the 1997 Amsterdam Treaty, and the 2009 Lisbon Treaty.

[1] European Commission, Directorate-General for Research and Innovation, Allmendinger, J., An ever closer union among the peoples of Europe? – Rising inequalities in the EU and their social, economic and political impacts – Outcomes of EU–funded research, Publications Office, 2014, https://data.europa.eu/doi/10.2777/87868

As a result, there have been several trans-national exchanges created linking the electricity markets of various members states, *e.g.*, Omie, EpexSpot, Nord Pool, *etc.*, as illustrated in Figure 1 below.

Figure 1: Power Markets in European Union, adopted from the CERC Paper

Nevertheless, there remain substantial differences in the power price across different member states, even those operating within the same exchange.

For example, the prices paid by household consumers in 2H 2022[2] are presented in Figure 2:

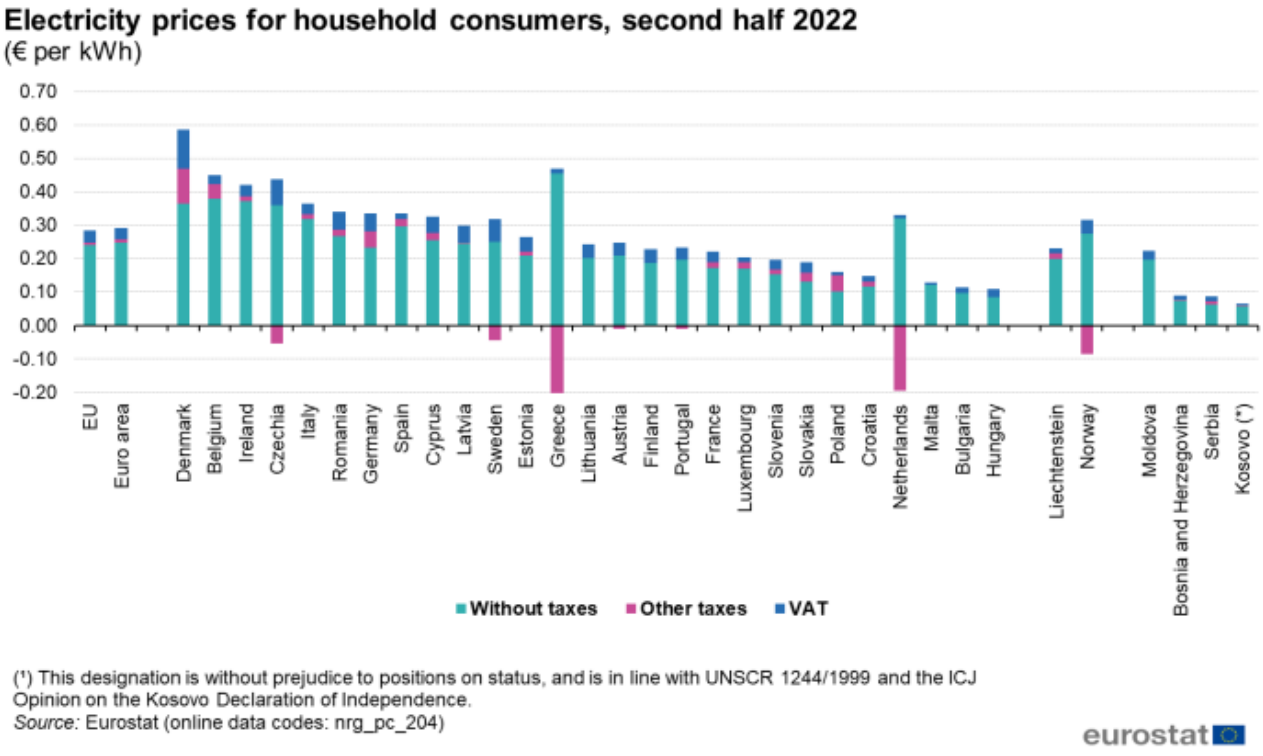

Figure 2: electricity prices for domestic consumers in the EU in 2H 2022, data from Eurostat[2]

[2] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Electricity_price_statistics

and the prices paid by non-household consumers in 2H 2022[2] are presented in Figure 3

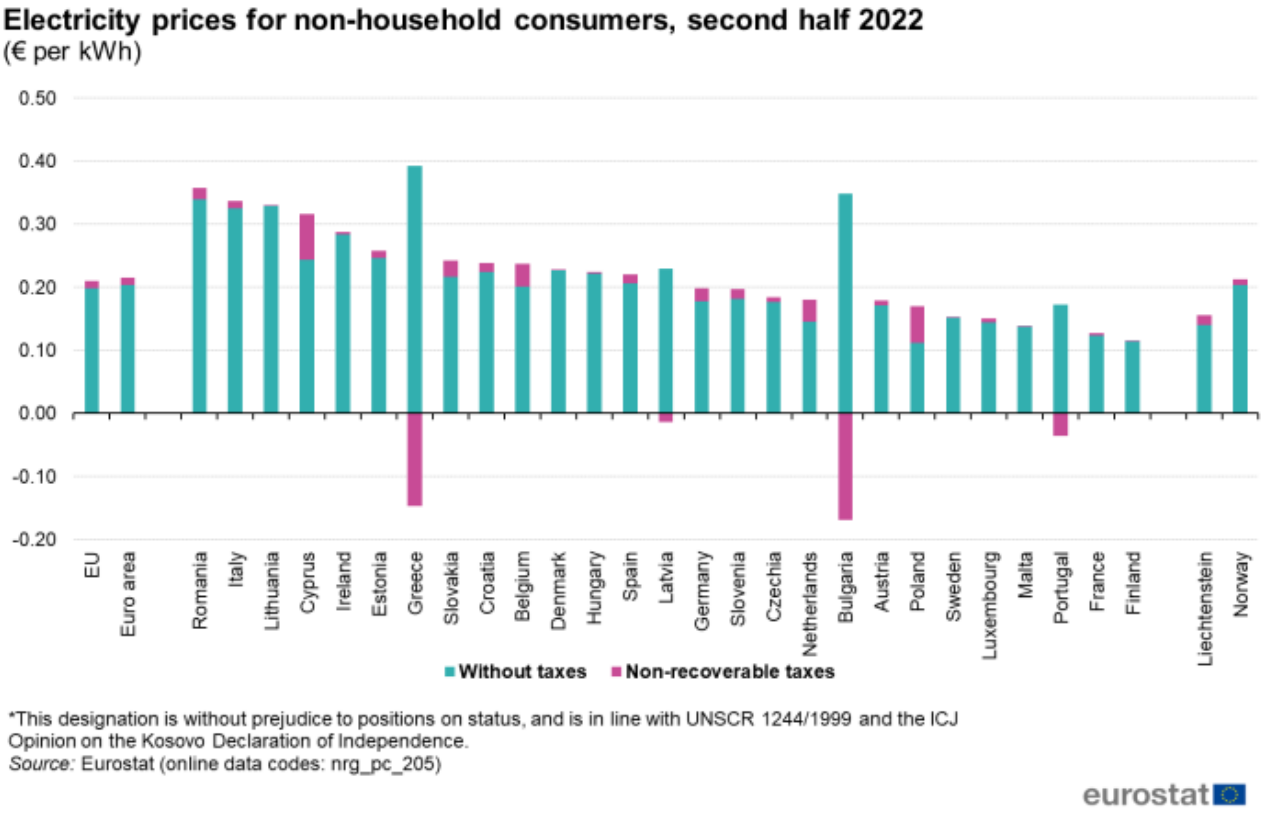

Figure 3: electricity prices for non-domestic consumers in the EU in 2H 2022, data from Eurostat[2]

As can be observed, substantial differences exist between member states, both in terms of the level of taxes and also the underlying cost of electricity.

For example, in 2H 2022, France was €0.21/kW, Germany was €0.33/kW, Brussels was €0.34/kW, and Netherlands was €0.06/kW in 2022, with each of these member states part of the same exchange; EPEX SPOT. Consequently, we can conclude that including multiple grids within one exchange, despite the increase in liquidity that follows, is not obvious that this is a remedy for price disparity within that exchange.

Finally, Annex 1 of CERC's paper presents a theoretical analysis to support the concept of market coupling to improve liquidity. However, California's market reforms in the 1990s provide a very substantial cautionary tale[3] vis a vis the kind of unintended consequences that can arise from modifying electricity market regulations. Thus, before CERC choose to pursue this course of action, I would strongly encourage you to develop more evidence supporting the hypothesis that exchange integration will, in fact, deliver the outcome desired, and that the specific advantages of achieving this will outweigh any possible disadvantages or less favourable consequences.

Yours sincerely,

Prof Niall Mac Dowell

[3] https://www.nber.org/papers/w8442