

### Reply to Referee 3

1. The relationship between energy and growth is well documented in the literature including for Pakistan. But previously researches mainly focused on the aggregate growth by taking GDP as their dependent variable. There are only few studies who took output of important economic sector (industrial), no one did for Pakistan, and those mainly from the developed nations. Therefore this study could fill the gap in the literature regarding the relationship of the said variables in the developing nations, or the countries who have been struggling for years to change the growth pattern from agriculture to industrial output but due to the stumbling block of energy shortages would not make them able to get through successful growth. Furthermore, in order to develop industrial as well as energy policies, governments of the developing nations are more concerned on the symbiosis of industrial sector and energy. As industrial sector is a significant market for energy, and the process of industrialization is affected by the advancement in energy sector and vice versa.

2. Pakistan is the developing country and has been striving to make structural changes from agriculture to industrial based growth. The geographical location of Pakistan could make it possible to generate enormous solar and wind energy which could significantly contribute to reduce the energy supply and demand gap. On the other hand Pakistan is 6<sup>th</sup> largest in coal reserves but still the country is able to produce just around 7% (2007) energy from coal. For this reason, it is equally important that at the present position we should analyze and indentify the significance and contribution of current energy sources on which Pakistan's industrial sector is depended, so that we could produce energy policy complemented with industrial policy in order to protect and attract foreign investments in this sector.

3. Let me focus once again on the few points which reveal that this research becomes very interesting case study for the Pakistan.

- The current gap between supply and demand reaches to 7,500 megawatts (MW).
- According to the one of the report which says, 40% of the Pakistan's industry had already been shifted to Bangladesh and other parts of the world.
- The Federal Bureau of Statistics revealed that country imported petroleum products worth of \$8.355 billion in July-April 2011-2012, up by 69.81% if compared with \$4.920 billion of July-April 2010-2011.
- The large scale manufacturing has been declining their growth from 18.8% in 2004-05 to -8.2% in 2008-09 (Economic Survey of Pakistan-2010).

4. Let me focus on the issue against the referee's remarks of replicating an econometric technique for a new country. Sometime what happens, the researchers adopted right methodology but due to selection of variables and its measurement issues arises as a result conflict and objection arises between the researchers and their studies. Therefore it should be consider that sometimes it's not just mere replication of the econometric technique but due to objection over the some technical flaws or having measurement issues with variables could make researcher to revisit the same study with appropriate variables selection and reduce the technical and modeling weaknesses which were present before, in order to reveal and understand the relationship or phenomena more clear and proper way for policy making.

5. The suggested points regarding literature review is strongly considered in the revised version of the paper.

6. The suggested point regarding the explanation of choosing the Johansen methodology over the ARDL approach is going to be addressed in next improved version of the paper.

7. The price variable is selected to put in the model by taking to its broader interpretation that is, firstly, price performs significant function in level of effective performance of the economy. Secondly, energy is a significant part of the consumer basket, and rise in the energy prices could be instinct indicated in a rise in the CPI. Furthermore, it is common practice in Pakistan that increased fuel prices leads an upward movement in the cost composition of industries, which is forwarded to the consumers. On the other hand, it is observed that government of Pakistan has been spending trillions of rupees on account of financing energy subsidy. At last but not the least, there are active price regulatory authorities under the local governments who play their role to check and balance on proportionality of price rise. In this regard to choose the CPI as a proxy of energy prices in Pakistan would be justifiable in our case of study.

8. The brief section about policy recommendations would be incorporated in the improved form of the paper as suggested.