

INTERLEAVED INERTIAL SUPPORT OF WIND TURBINES

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Yazar Ad Soyad

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INTERLEAVED INERTIAL SUPPORT OF WIND TURBINES

submitted by **Yazar Ad Soyad** in partial fulfillment of the requirements for the degree of **Master of Science in Computer Engineering Department, Middle East Technical University** by,

Prof. Dr. Gülbin Dural Ünver
Dean, Graduate School of **Natural and Applied Sciences**

Prof. Dr. Bölüm Başkanı
Head of Department, **Computer Engineering**

Ozan KEYSAN
Supervisor, **Department of Electrical and Electronics Engineering, METU**

Examining Committee Members:

Prof. Dr. Jüri
JüriBölüm, METU

Prof. Dr. Jüri
JüriBölüm, METU

Prof. Dr. Jüri
JüriBölüm, METU

Assoc. Prof. Dr. Jüri
JüriBölüm, METU

Assist. Prof. Dr. Jüri
JüriBölüm, Ankara University

Date:

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last Name: Yazar Ad Soyad

Signature :

ABSTRACT

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Duymaz, Erencan

M.S., Department of Computer Engineering

Supervisor : Ozan KEYSAN

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Abstract

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ÖZ

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LIST OF ABBREVIATIONS

K_{1s1}

K_{1saltma1}

K_{1s2}

K_{1saltma2}

CHAPTER 1

INTRODUCTION

1.1 Global Renewable Energy Status

Renewable energy is still one of the hottest topics in the power area. The share of the renewable energy systems has been reached significant levels. At the end of 2016, the renewable power capacity has reached 2011 GW throughout the world including hydropower plants.[1] The renewable capacity for the leading countries is given in the Figure 1.1. Almost half of this capacity belongs to four leading countries namely; China, USA, Brazil and Germany.

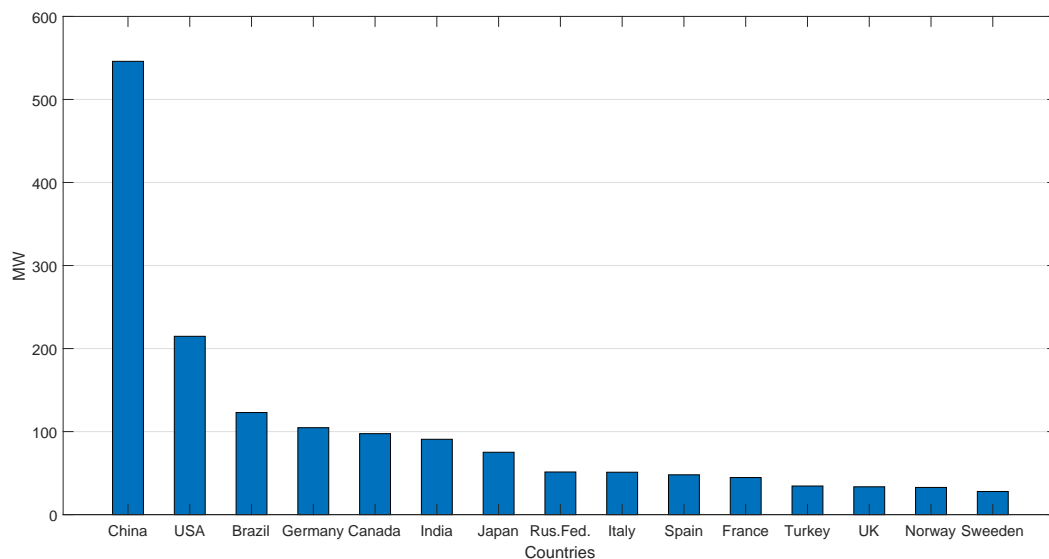


Figure 1.1: Installed Renewable Energy Capacity of Leading Countries in 2016[1]

Figure 1.2 shows the energy production from renewable energy systems. It is clear that China, USA and Brazil produces highest amount of energy from renewable since they already have the highest installed capacity. However, India and Canada produces

more energy than Germany even though Germany has more installed capacity. This result is due to the fact that renewable energy system production is dependent on parameters such as solar radiation and wind speed depending on the renewable source.

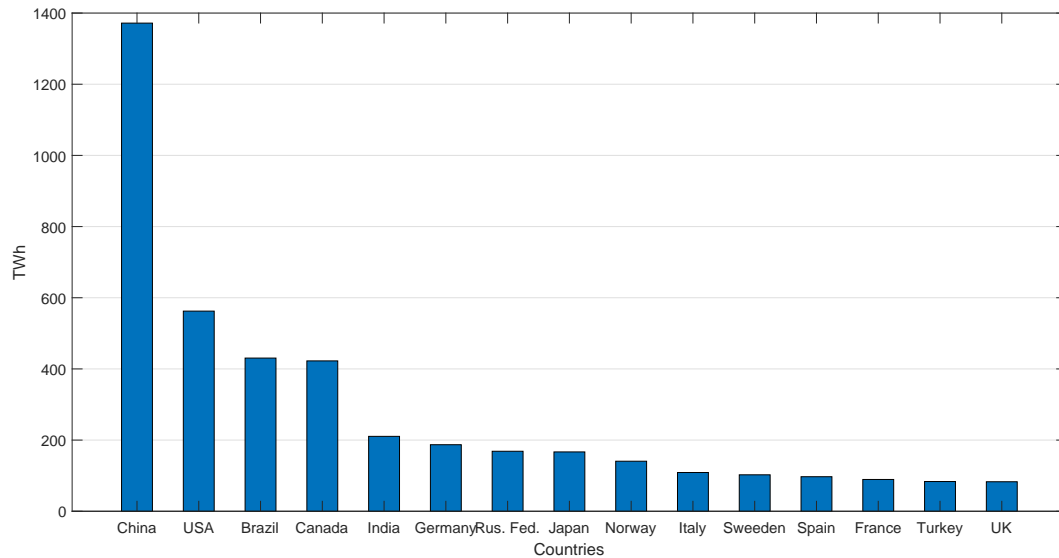


Figure 1.2: Renewable Energy Production of Leading Countries in 2016 [1]

1.2 EU 2020 Goals

In 2008, 20 20 by 2020-Europe's Climate Change Opportunity report has been released by EU Commission and two key targets are set for 2020 [3]:

- At least 20 % reduction in greenhouse gases (GHG) by 2020
- Achieving 20% renewable energy share in energy consumption of EU by 2020

The Renewable Energy Directive is published in 23 April 2009. This directive has set national binding targets for EU countries in order to accomplish the 20% renewable energy target for EU and 10 % target for the renewable energy usage in the transport. [4] As a result, each EU country has been determined their national action plans. In order to achieve the 20 % target, each member state determine their own targets ranging from 10% in Malta to 49% in Sweeden.

According to the latest release by Eurostat, renewable share of the EU in energy consumption has reached 17 % in 2016 [2]. Eleven of EU member states has already achieved their 2020 targets. Renewable shares of EU members are shown in Figure 1.3.

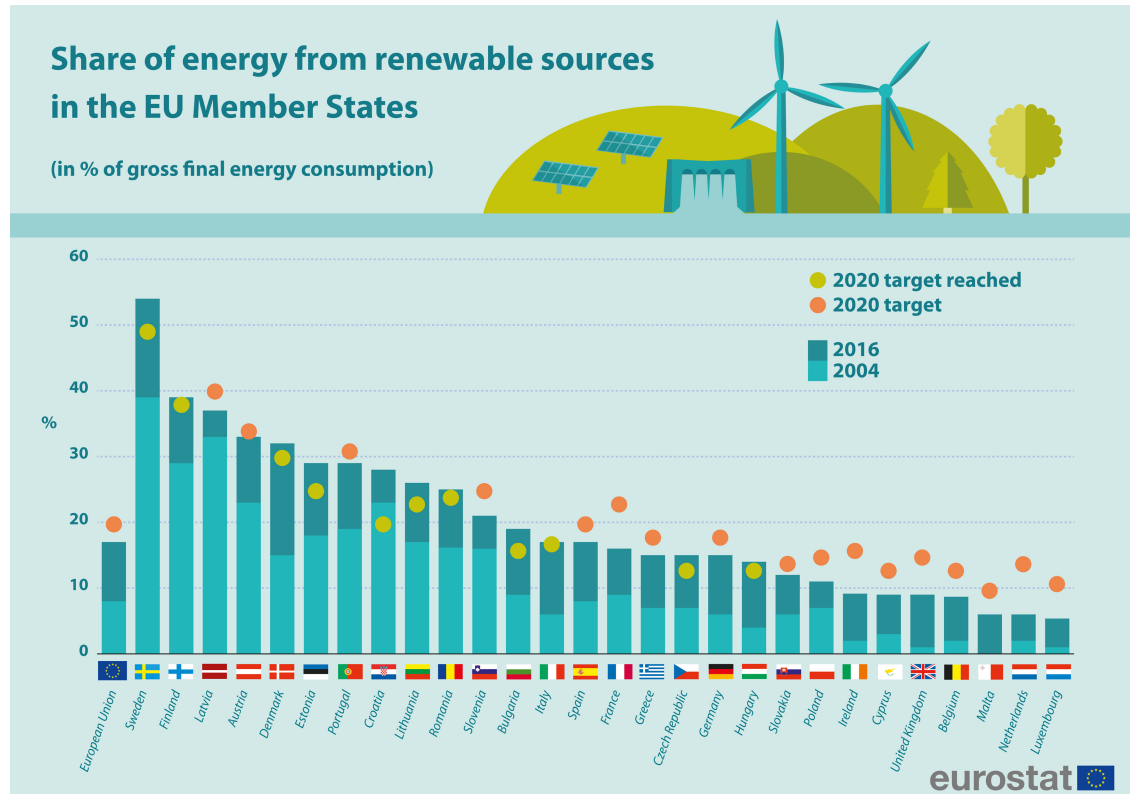


Figure 1.3: Renewable Targets of EU Member States[2]

1.3 Wind Energy Status

Wind power has the highest share in the renewable energy except for hydropower. The wind power capacity at the end of 2016 has reached 467 GW worldwide. The wind power capacity of the leading countries are given in the Figure 1.4. China and USA have also the highest installed capacities in the wind power. Moreover, it should also be noted that the share of the wind power in the total installed capacity is more important than total wind power capacity

The energy production from wind energy is shown in the Figure 1.5. Even though China has the highest wind power capacity, USA generates more energy from wind

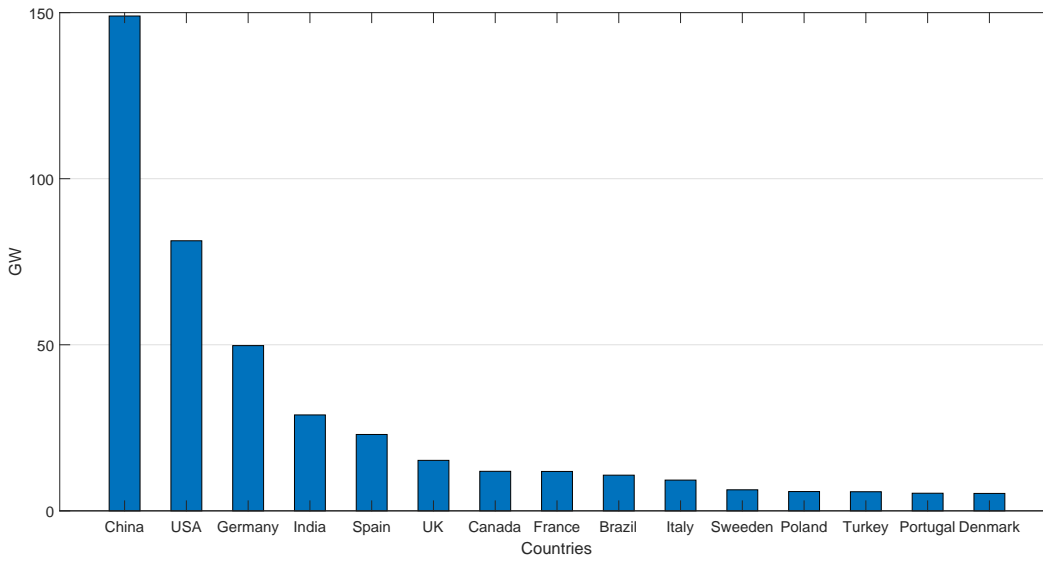


Figure 1.4: Wind Power Capacity of Leading Countries in 2016[1]

than any other country.

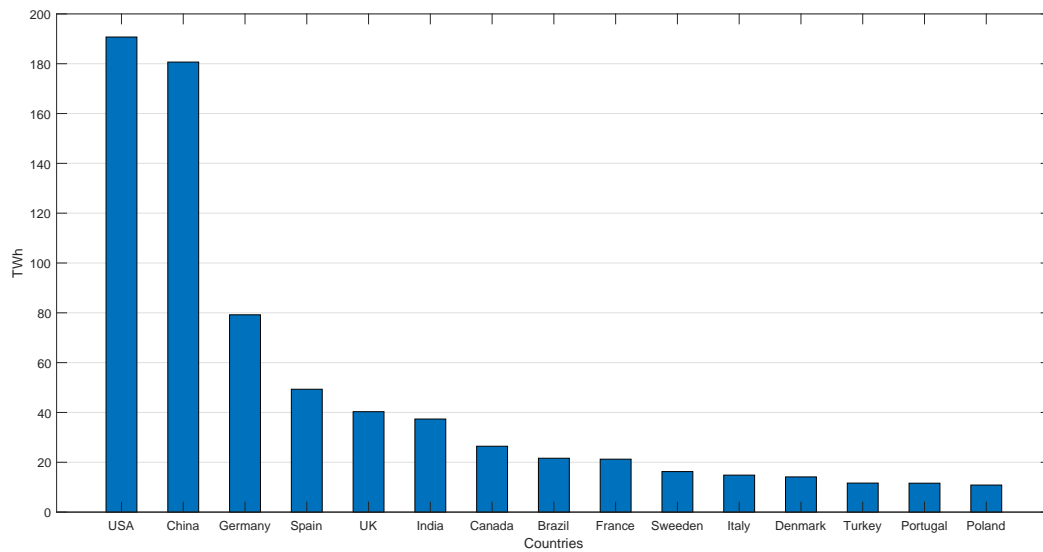


Figure 1.5: Wind Power Production of Leading Countries in 2016[1]

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- [2] Eurostat, “Renewable energy in the EU-newsrelease,” Tech. Rep. January, 2018.
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APPENDIX A

EK A

A.1 Örnek Kısım

Kısım içine yazılacaklar...