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20th World Wind Energy Conference & Exhibition (WEEC 2022)

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20th World Wind Energy Conference & Exhibition (WEEC 2022)

Astiaso Garcia D.[1,2], Lamagna L.[1], Gsänger S.[3], Martone S. [2], Rae P.[3], Reggiani R.[4], Togni S.[2]

1 Sapienza University of Rome, Italy
2 ANEV, Associazione Italiana Energia del Vento, Italy
3 WWEA, World Wind Energy Association
4 Adria Congrex

davide.astiasogarcia@uniroma1.it

Abstract. This paper represents a preface to the Proceedings of the 20th World Wind Energy Conference & Exhibition (WEEC 2022) held in Rimini, Italy, from the 28th to the 30th of June 2022. Background information, conference resolution and the organizational structure of the meeting, program committee, and acknowledgments of the contributions of the many people who made the conference a success are presented.

1. Background

The 20th World Wind Energy Conference & Exhibition (WEEC 2022) has been held in Rimini, Italy, from the 28th to the 30th of June 2022 and covered a wide range of relevant topics, with focus on some of the most important areas and latest achievements.

Several sessions have been dedicated to two of the most important current topics of wind power deployment: offshore wind energy as well as community energy and community engagement.

Countries around the world have started to incentivise offshore wind power and the sector has seen huge growth rates and an astonishing technological progress. In the Mediterranean sea, Italy is one of the most promising offshore wind markets. Two sessions dealt with latest developments in technology and presented opportunities and challenges of the current offshore wind markets.

With the rapid increase in wind power installations, the role of citizens and communities as active drivers of these developments has become more than obvious. Accordingly, two dedicated sessions discussed best ways to increase local, community-based ownership and how to best engage communities and citizens in wind projects, by maximising benefits for them. The ultimate goal was to discuss how to strengthen not only acceptance, but support for wind power deployment.

In the light of the above considerations, the conference topics are listed below, with some examples of references, with particular regard to the author scientific publications for each one of them:

Wind Technology Advancement and Managing
1.   The Wind Power value-chain [1,2]
2.   Wind turbine and wind farms materials and constructions [3,4]
3.   Wind resource assessment and Forecasting [5,6]
4.   Innovation in wind technology and the Retrofitting process [7,8]

5.　　　Rotor Blades [9,10]
6.　　　Digitalisation: Application of AI, cyber security, and Digital Twin in energy systems [11,12]
7.　　　Offshore wind: Permits, Procedures & Solutions [13,14]
8.　　　Offshore supply chain [15,16]
9.　　　Offshore digitalisation [17, 18]
10.　　Operation and Maintenance offshore [19,20]

Renewables integration and storage systems
1.　　　Electric vehicles [21,22]
2.　　　Green hydrogen economy strategies [23, 24]
3.　　　Renewables in shipping [25]
4.　　　Virtual power plants, bitcoin and other digital marketing strategies [26, 27]
5.　　　Flexibility Management [28, 29]
6.　　　Sector Coupling [30, 31]
7.　　　Storage Systems [32, 33]
8.　　　Solar energy [34, 35]
9.　　　Hydro energy [36, 37]
10.　　Bioenergy [38, 39]
11.　　Geothermal energy [40]
12.　　Wave energy [41, 42]

Economic & Policy
1.　　　Wind policy regulation at national and international level [43]
2.　　　Renewable energy transition [44, 45]
3.　　　Finance and Business Model [46, 47]
4.　　　Renewable energy prosumers models [48, 49]
5.　　　Ancillary services [50]
6.　　　Power purchase agreements [51]
7.　　　Opportunities from the European Green Deal and similar programmes [52]

RES and the Communities
1.　　　Fair wealth distribution mechanism of income [53]
2.　　　Energy communities: Business models [54]
3.　　　Community involvement: best practices [55]
4.　　　New projects in remote areas to cope with economic depression [56]
5.　　　Microgrids and Energy Communities [57]
6.　　　Energy Access and Energy Security [58]
7.　　　Off-grid energy systems [59]
8.　　　Start-ups and Business Innovation

Best Practices
1.　　　Health and Safety Executive procedures [61]
2.　　　Operation and Maintenance prediction [62]
3.　　　Wind connection and integration with power Grids [63]
4.　　　Long distances energy transmission [64]
5.　　　Permitting processes [65]
6.　　　Environment Impacts and mitigations [66, 67]
7.　　　End life processes and LCA [68]
8.　　　International cooperation projects and initiatives [69]
9.　　　Local and regional cooperation [70,71]

10.   Mediterranean Basin potentialities and synergies between European and not European countries [72, 73].

2. WWEC 2022 Conference resolution

The World Wind Energy Association (WWEA) and the Italian Wind Energy Association (ANEV) welcome the presence of more than 160 participants from over 30 countries attending this Conference, on wind, solar, and all other renewable energy technologies.

The Conference appreciates that delegates from around the world have participated and made it a truly international meeting, in spite of many more potential delegates having been prevented from attending the conference because of the direct and indirect impact of Covid.

In addition, the Conference has been held at a time when the Russian war against Ukraine has revealed to the general public that the fossil and nuclear energy system leads to geopolitical imbalances and eventually represents a threat to peace in the world. Only a 100% renewable energy world will allow the world to get rid of international dependencies and to reduce international tensions.

Accordingly, the Conference gave special consideration to how a renewable energy future can help to ensure peace, next to covering all aspects of mainstreaming and growing wind and renewable utilisation and the related policies, science and technology, manufacturing, research & development, operation, offshore and small wind, integrated solutions, capacity development, community involvement as well as other economic and social issues.

The Conference appreciates the support of many organisations, especially the IRENA Coalition for Action, the REN Alliance including the International Geothermal Association, International Hydropower Association, International Solar Energy Society and World Bioenergy Association, REN21, the Global 100% Renewable Energy Platform, Energy Watch Group, the Global Women's Network for the Energy Transition, the World Council for Renewable Energy, Eurosolar, EREF, RCREEE, RES4Africa, AIEE, ISES Italia, Comune di Rimini, all media partners and all organisations and individuals enhancing the Conference.

The Conference thanks, in particular, the cross-section of sponsors without whose support such an international conference would not be possible.

The Conference underlines that the emergency of the climate crisis as well as the energy and security crisis have all been mainly driven by fossil and nuclear fuels and that the only feasible response to tackle these crises is the immediate rollover to 100% renewable energy globally. A renewable energy world can provide for not only a sustainable life but also equal opportunities for people all over the world.

The Conference appreciates the manifold statements made in particular by political representatives about the importance of the role of citizens and communities in the energy transformation. The renewable energy sector and local communities need to create close alliances in order to maximise socioeconomic benefits, to fight energy poverty, to strengthen democracy and to accelerate the deployment of renewable energy, in particular in the form of community energy and energy communities. The Conference applauds the WWEA Working Group for developing guidelines and recommendations for community engagement.

The Conference understands the huge potential of offshore wind in particular in Italy and in the Mediterranean and the Conference welcomes the Italian Offshore Wind Manifesto which has been published on the occasion of WWEC2022, describing the main barriers and solutions needed for a rapidly developing offshore wind industry.

The Conference welcomes the making of the World Wind Energy Award to Hans-Josef Fell for his political achievements and the recognition of the need for governments to act and to Heinrich Bartelt for his decades long work and achievements as pioneer, entrepreneur and NGO representative.

The Conference encourages all wind energy and associated stakeholders to participate in the next World Wind Energy Conference which will be held in Hobart, Australia, in April 2023.

3. Conference Committees

Conference Chairpersons

    Hon. Peter Rae, WWEA President

    Dr. Simone Togni, ANEV

Executive Chair

    Prof. Davide Astiaso Garcia, Sapienza University, ANEV

    Mr. Stefan Gsänger, WWEA Secretary General

    Ms. Rita Reggiani, Adria Congrex

Programme Chair

    Prof. Chuichi Arakawa, Kyoto University

    Dr. Osman Benchikh, former head of RE at UNESCO

    Mr. Khalid Benhamou, Sahara Wind

    Prof. José Cataldo, Uruguay

    Dr. Robert Dixon, US Department of Energy

    Dr. Daniele Groppi, Sapienza University

    Dr. Jami Hossain, WWEA Technical Committee

    Dr. Tetsunari Iida, ISEP

    Dr. Andryi Konechenkov, Ukrainian Wind Energy Association

    Dr. Mario Lamagna, Sapienza University

    Dr. Meysam Majidi Nezhad, Sapienza University

    Dr. Claudio Monteforte, Idnamic

    Prof. Conrado Moreno, CETER

    Prof. Memi Motosu, Nagoya University

    Dr. Monica Oliphant, ISES

    Prof. Galal Osman, Egypt Wind Energy Association

    Dr. Haiyan Qin, Chinese Wind Energy Association

    Dr. David Renné, International Solar Energy Society

    Prof. Dr. Choong-Yul Son, KWEIA

    Dr. Christof Stork, DNV

    Prof. Tanay Sidki Uyar, Beykent University

4. Conclusions

We hope that readers of the proceedings will find that the presented papers are valuable references for supporting their research and development in the fields of wind energy technologies and assessment, offshore wind and Renewable energy production and energy efficiency research.

Acknowledgments

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