Renewable Energy Development Scenarios

Alessandro Cogollo*

Politecnico di Milano
cogolloalessandro@gmail.com

June 4, 2022

Abstract

This manual aims to describe the software developed as a Computer Engineering project, presenting technologies, tools and architectural choices based on the scenario in which it's located. The developed software comes in hand to support the renewable enery development, providing futures scenarios used to lead changes. Furthermore, the manual represents a brief guide with an explanation on how to install the software.

I. Introduction

The proposed project aims to create an interactive web interface which will be integrated in the RSE S.p.A. dissemination platforms, for supporting future renewable energy development scenarios, which constitutes one of the core activities in RSE. The website will support the computation of the photovoltaic capacity distribution and the expected production in Italy at a province scale for the achievement of the European Green Deal goals. Starting from variable input parameters and spatialized indicators, the interface should allow the spatial and graphical representation of the intermediate and final outputs.

II. Architecture

The software is meant for web, and is composed by three main modules, allowing any distribution on multiple servers. First module is the web server, which receives requests from a client and dispatch them to the computation module; it's deputed to retrieving parameters inserted by the user, and to display the plotted graphs. Computational module is responsible for querying the database (PostgreSQL, explained later) and obtaining input values to calculate arrays, required to plot graphs and maps. Finally, the computational module passes values to be plotted to the graph module, which displays them, and return to the web server the map as an html file. Pictures explains

III. Tools

The software is composed by three main modules, to allow any distribution on multiple servers. First module is the web server, which receives requests from a client used to calculate the parameters

Text requiring further explanation[1].

IV. Datas

Regarding the database, a PostgreSQL database was choosen, since it represents a powerful, open source object-relational database system, and has powerful addons such as the popular PostGIS geospatial database extender. In fact, PostgreSQL offers in addition to the usual MySQL datatypes, the possibility to store geometry types: Point, Line,

*A thank you or further information

[1]Example footnote

Table 1: *Input*

Name	
Table	Input
Photovoltaic Installed	Installed Power LAND
Photovoltaic Installed	Installed Power ROOF

Circle, Polygon, which has been used to store datas about provinces' borders.

Accenni a dati ISTAT Accenni a setup del db

V. Parameters

VI. Formulas

$$sumbuiltsurface = sumvaluesof\textbf{built surface} \tag{1}$$

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

VII. Flow

i. Subsection One

A statement requiring citation [Figueredo and Wolf, 2009]. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

ii. Subsection Two

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

VIII. Visualization

i. Graphs

A statement requiring citation [Figueredo and Wolf, 2009]. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede.

Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

ii. Plots

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

IX. Installation

Provide a db dump

X. Conclusion

References

[Figueredo and Wolf, 2009] Figueredo, A. J. and Wolf, P. S. A. (2009). Assortative pairing and life history strategy - a cross-cultural study. *Human Nature*, 20:317–330.