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# CASE STUDY 1

*TITLE* Renewable Energy Sources (RES) Projects and their barriers on regional scale

The case study of wind parks in the Dodecanese islands, Greece

*OBJECT*

Satisfy the future energy needs for the island

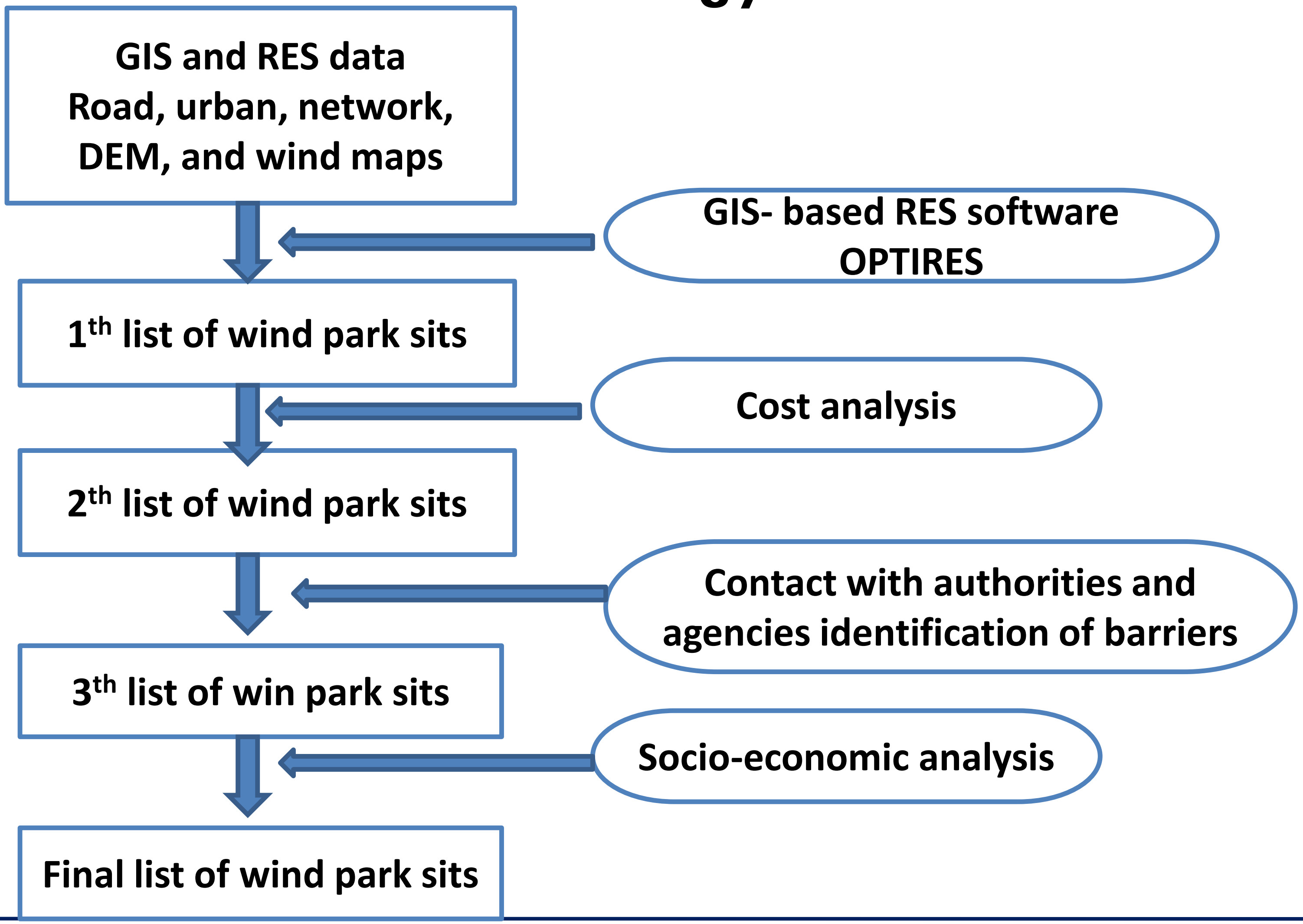
To reduce gas emission (green house effect)

*REASON WHY YOU CHOSE IT/ YOU CONSIDERED IT RELEVANT FOR THE PURPOSE OF ENEPLAN*

provide an easy to apply methodology for renewable energy sources projects (Selection of wind parks by using GIS-based software ). The methodology can by applied for different energy projects for different areas

*(Al Balqa Applied University, Jordan . Amjad A. Abu Sirhan)*

# The outline of the methodology



# The criteria of selection sites for wind park

- Sits with an average annual wind speed of >7.5 m/s
- Suitable slope, distance to existing road network
- Exclude sites which are environmentally protected , Air port
- within 1km of urban area
- Visible within 3 km from archaeological sites
- Upper allowable penetration limits ( 30% )

# Final map: The location of 19 wind parks in the Dodecanese islands proposed by OptiRES

# CASE STUDY 2

*TITLE* $H_2$RES, Energy planning tool for island energy systems
The case of the island Mljet

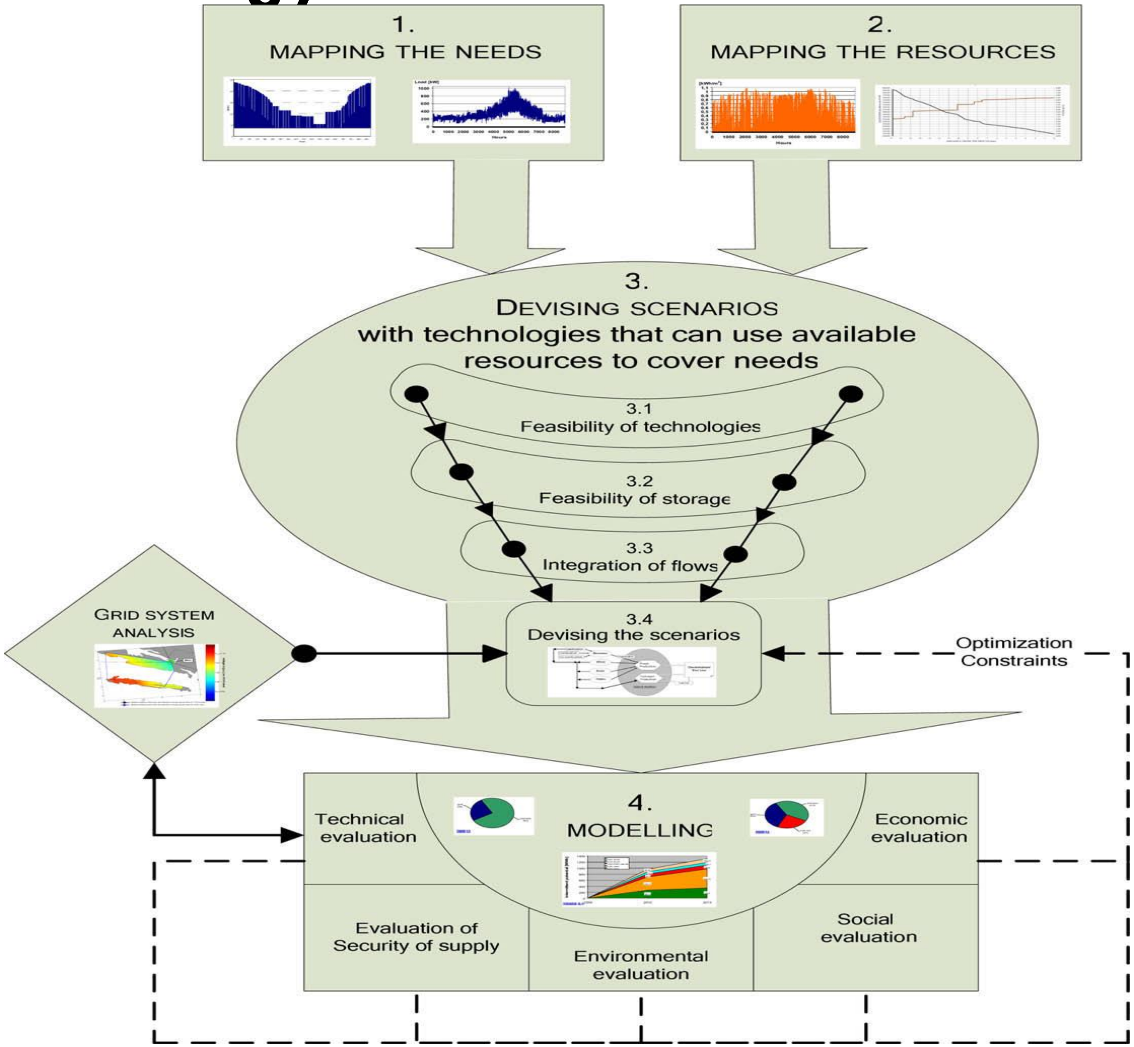
*OBJECT*

Introduce a computer program ($H_2$RES )for simulation of different energy planning scenarios for future energy needs of Mljet island

*REASON WHY YOU CHOSE IT/ YOU CONSIDERED IT RELEVANT FOR THE PURPOSE OF ENEPLAN*

$H_2$RES model could be successfully applied for different energy planning projects for s isolated areas which operate as stand alone systems

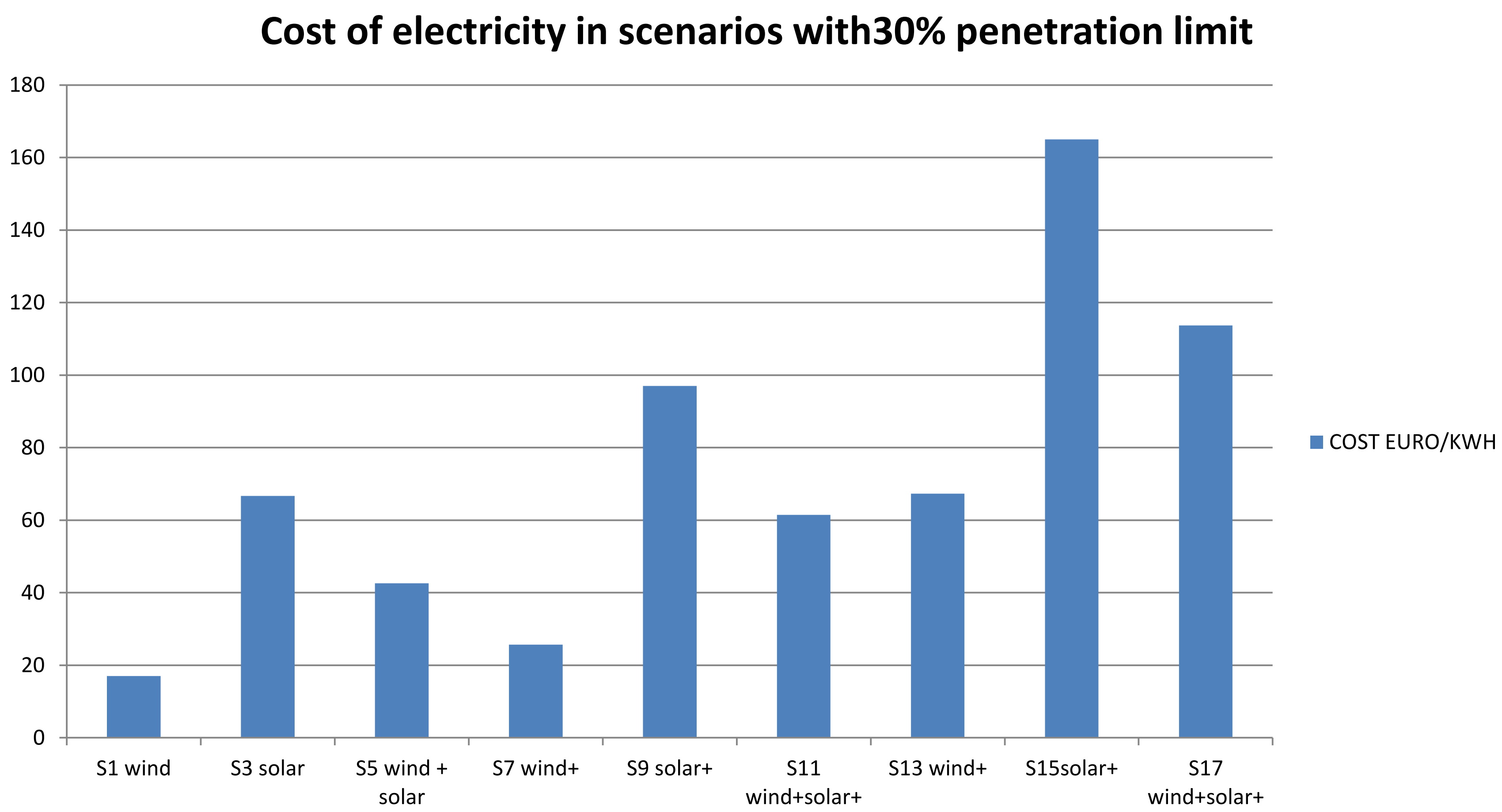
# ADEG methodology scheme



# Installed components in scenarios with 30% limit on hourly penetration.

| | Wind [kW] | PV [kW] | Electrolyser [kW] | Fuel cell [kW] | H2 storag [kWh] | Grid [kW] |
|---|---|---|---|---|---|---|
| S1 | | | | | | |
| 2010 | 132 | 0 | 0 | 0 | 0 | 7676 |
| 2015 | 198 | 0 | 0 | 0 | 0 | 7676 |
| S3 | | | | | | |
| 2010 | 0 | 323 | 0 | 0 | 0 | 7676 |
| 2015 | 0 | 452.62 | 0 | 0 | 0 | 7676 |
| S5 | | | | | | |
| 2010 | 99 | 255 | 0 | 0 | 0 | 7676 |
| 2015 | 132 | 369.75 | 0 | 0 | 0 | 7676 |
| S7 | | | | | | |
| 2010 | 264 | 0 | 200 | 45 | 4500 | 7676 |
| 2015 | 357 | 0 | 225 | 65 | 10500 | 7676 |
| S9 | | | | | | |
| 2010 | 0 | 587 | 175 | 50 | 1200 | 7676 |
| 2015 | 0 | 822 | 250 | 65 | 3900 | 7676 |
| S11 | | | | | | |
| 2010 | 132 | 459 | 175 | 50 | 1200 | 7676 |
| 2015 | 165 | 670.65 | 200 | 60 | 3900 | 7676 |
| S13 | | | | | | |
| 2010 | 526 | 0 | 350 | 40 | 87000 | 7676 |
| 2015 | 751 | 0 | 500 | 55 | 111000 | 7676 |
| S15 | | | | | | |
| 2010 | 0 | 1105 | 375 | 50 | 33000 | 7676 |
| 2015 | 0 | 1564 | 550 | 75 | 44400 | 7676 |
| S17 | | | | | | |
| 2010 | 132 | 963.05 | 350 | 50 | 31050 | 7676 |
| 2015 | 366.5 | 1071 | 450 | 75 | 44400 | 7676 |

# Cost of electricity in scenarios with 30%penetration limit



# Reduction in emissions in scenarios with 30% limit.

| Reduction in emissions (tons/year) | | | |
|---|---|---|---|
| | CO2 | SO2 | NOx |
| S1 | 119.84 | 0.43 | 0.26 |
| S3 | 113.05 | 0.40 | 0.24 |
| S5 | 175.57 | 0.62 | 0.37 |
| S7 | 194.78 | 0.69 | 0.41 |
| S9 | 170.87 | 0.61 | 0.36 |
| S11 | 240.66 | 0.85 | 0.51 |
| S13 | 198.15 | 0.70 | 0.42 |
| S15 | 198.89 | 0.71 | 0.42 |
| S17 | 264.19 | 0.94 | 0.56 |

# Surface of the island necessary to cover by PV modules in scenario 12.