EnergyPLAN modelling (100%)

*Students will have to model a national energy system using EnergyPLAN (e.g. Ireland, UK) for a reference base year (2018) and for a future scenarios with a high penetration of VRE showing the impact of integrating two different energy storage technologies.*

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| Criteria | 0-30% | 31-44% | 45-49% | 50-59% | 60-69% | 70-100% |
| Criteria 1  **EnergyPLAN modelling of the reference scenario and of the future scenario (30%)** | Inability to use the model correctly | Many errors in the modelling | Some errors in the modelling, wrong data introduced, not correct model of the reference or future scenarios | The models are correct and only contain minor errors | Models are correct and the reference scenario has been validated. Some discrepancies exist between the model and the real data | Models are correct and perfectly validated. The reference scenario has small discrepancies between real and modelled data. |
| Criteria 2  **Knowledge & Understanding of the role of ES technologies**  **(25%)** | Has not grasped the theoretical or research base of the subject | Very limited understanding of specialised or applied areas of theoretical or research-based knowledge. Very limited rationale in describing the choices of ES technologies and in explaining their benefits. | Limited understanding of specialised or applied areas of theoretical or research-based knowledge. Limited rationale in describing the choices of ES technologies and in explaining their benefits. | Demonstrates understanding of specialised or applied areas of theoretical or research-based knowledge. Some explanation about the rationale for choosing the ES technologies and explaining their benefits. | Clear understanding of specialised or applied areas of theoretical or research-based knowledge. Clear explanation about the rationale for choosing the ES technologies and explaining their benefits. | Systematic understanding of specialised and/or applied areas of theoretical or research-based knowledge. Exceptional explanation about the rationale for choosing the ES technologies and explaining their benefits, also through a with a wide variety of references. |
| Criterion 3  **Analysis and interpretation (30%)** | No analysis or interpretation of the model results and on the effects of using ES technologies in a national energy system. Poor or very poor presentation of results | Little or no analysis and interpretation of the model results and on the effect of using ES technologies in a national energy system. Poor presentation of results | Limited ability to analyse and/or interpret the model results and the effect of using ES technologies in a national energy system., Limited ability in communicating the outcome | Reasonably competent in analysing and interpreting the model results and the effect of using ES technologies in a national energy system. Reasonably competent in communicating the outcome | Competent in analysing and interpreting the model results and the effect of using ES technologies in a national energy system. Competent in communicating the outcome | Very high level of competence in analysing and interpreting the model results and the effect of using ES technologies in a national energy system. High level of competence in communicating the outcome |
| Criterion 4  **Reference or bibliography** (5%) | Inadequate referencing and bibliography | Limited referencing and bibliography | Adequate referencing and bibliography | Appropriate referencing and bibliography | Comprehensive referencing and bibliography | Excellent referencing and bibliography |
| Criterion 5  **Presentation, grammar and spelling**  **(10%)** | Unacceptable presentation, and structure | Poor presentation and structure | Weak presentation and structure | Neat presentation and structure | Clearly presented, logically structured | Excellent well directed presentation, logically structured |