Karlsruher Institut für Technologie

Energy ADE V. 1.0 - Documentation

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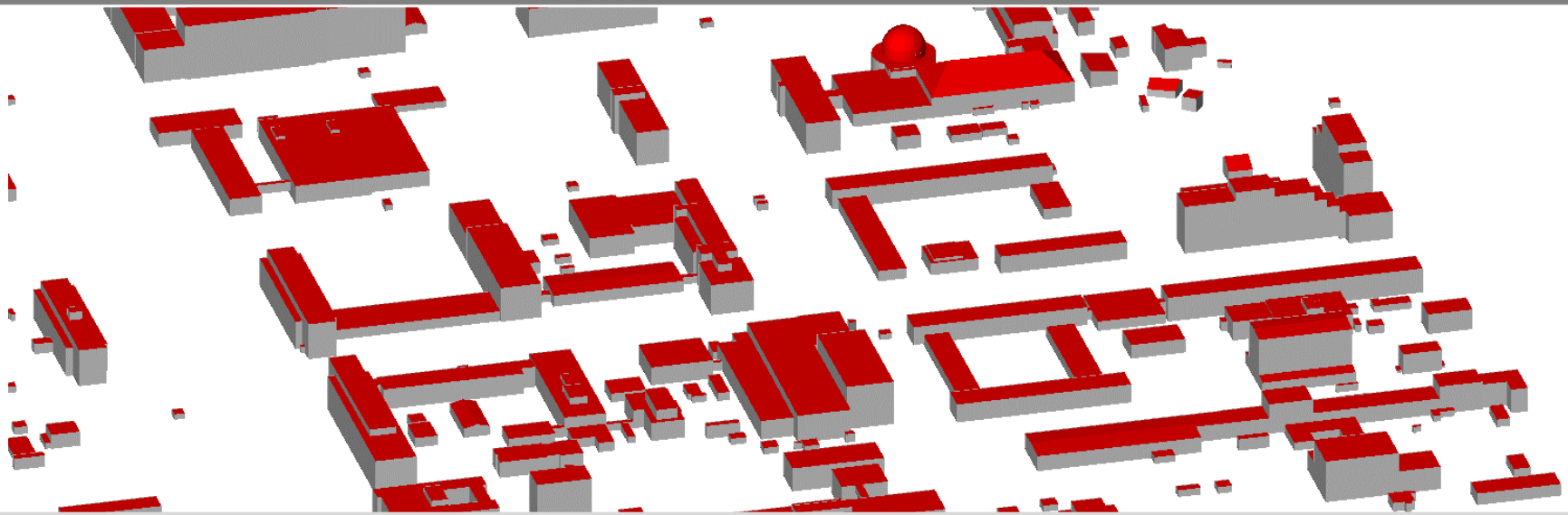


Energy ADE V. 1.0

- Publically available documents (http://www.citygmlwiki.org/index.php?title=CityGML_Energy_ADE)
  - UML-model (PDF-document)
  - XML-schema (EnergyADE.xsd)
  - Online Feature Catalogue
  - Specification (PDF-document)
- Publications
  - Agugiaro, G. et al.: "The Energy Application Domain Extension for CityGML: enhancing interoperability for urban energy simulations", Open Geospatial Data, Software and Standards (2018) 3:2.
  - Benner, J. et al.: "Virtual 3D City Model Support for Energy Demand Simulations on City Level" - The CityGML Energy Extension, Proceedings REAL CORP Conference 2016, Hamburg, 22 - 24 June 2016.
  - Nouvel, R. et al.: "Genesis of the CityGML Energy ADE", Proceedings of the CISBAT International Conference 2015 – Lausanne – Switzerland

Energy ADE specification document

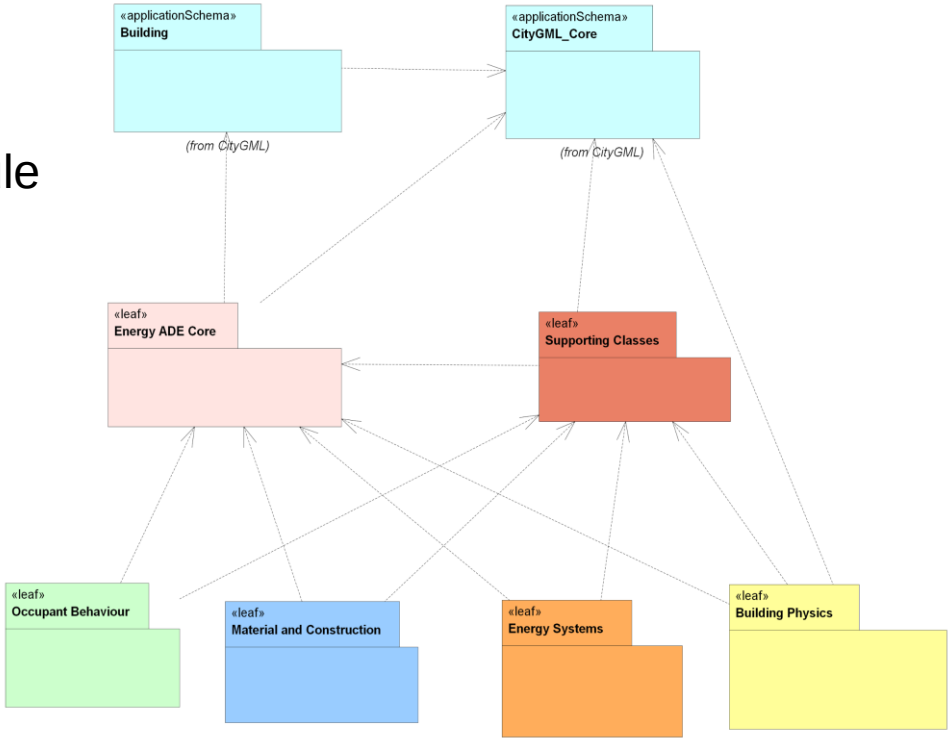
1. Introduction
2. Energy ADE thematic modules
3. Unit of Measurement identification
4. Energy ADE Codelists
5. Further information

1. Introduction

- Very short review of general goals, restrictions and possible use cases of the Energy ADE

2. Energy ADE thematic modules

- General overview of the different modules and their dependence structure
- One sub-chapter for each thematic module
  - Energy ADE Core module
  - Building Physics module
  - Occupant Behaviour module
  - Material and Construction module
  - Energy Systems module
  - Support classes



Description of thematic modules

- Contains all UML diagrams
- Describes basic concepts, functions and important properties of central classes, and their mutual relations.
- It was not intended to mention every feature / data tape / enumeration / codelist and every property / relation in the specification document. For this, the feature catalogue should be used

3. Unit of Measurement identification

- In GML (3.1 and 3.2), a physical quantity is represented by the type *gml:MeasureType*, combining the value of the quantity (type *double*) with an uom-identifier (type *URI*) for the unit of measurement.
- Neither GML nor CityGML standardize uom-identifiers.
- In Energy ADE models, a lot of physical quantities with different, partly ambiguous units occur (Bar ←→ Pascal, Joule ←→ Kilowatt-hours, Radian ←→ Degree, …)
- Without a standardization of uom-identifiers, an interoperable processing of Energy ADE models is impossible.

Proposal

- List of uom-identifiers for SI-units, partly with commonly used alternative units (non-exhaustive).
- General rules for the uom-identifier of a complex unit of measurement.
- Non-exhaustive list of uom-identifiers for complex uom, frequently occuring in the energy domain.
- List of uom-identifiers for some "special" uom

Combination rules

- A combined uom identifier consists of one numerator and one denominator, which are separated by a "/" character.
- uom identifiers in numerator and denominator are alphabetically ordered and separated by "*" characters.
- Neither in the numerator nor in the denominator, blank characters or brackets are allowed.
- Multiplications of the same uom identifier are expressed with an integer number as suffix, e.g. m*m as m2.

4. Energy ADE Codelists

- This chapter is rudimentary and only contains a list of codelists used in the Energy ADE.

5. Further information

CityGML 2.0 specification	https://portal.opengeospatial.org/files/?artifact_id=47842
CityGML Wiki	http://www.citygmlwiki.org/index.php?title=Citygml_Wiki
Energy ADE Wiki	http://en.wiki.energy.sig3d.org/index.php/Main_Page
Energy ADE GitHub	https://github.com/cstb/citygml-energy
Energy ADE XML Schema	http://www.citygmlwiki.org/images/a/ac/EnergyADE.xsd
Energy ADE UML diagrams (PDF document)	http://www.citygmlwiki.org/images/f/fb/UML-Diagrams_EnergyADE.pdf
Energy ADE Feature Catalogue	http://www.citygmlwiki.org/upload/EnergyADE%201.0/FeatureCatalogue/index.html