«FeatureType»
Core::AbstractCityObject

+demandedBy «Property»
0..*

+installedIn «Property»
0..*

«FeatureType»
AbstractEnergySystem

«Property»
+ numberOfDevices: Integer [0..1]
+ model: CharacterString [0..1]
+ serviceLife: ServiceLife [0..1]

energyAmount requires to be referenced by Dynamizer::AbstractTimeseries

«FeatureType»
EnergyDemand

«Property»
+ energyAmount: Measure
+ endUse: EndUseTypeValue
+ maximumLoad: Measure [0..1]
+ energyCarrierType: EnergyCarrierTypeValue [0..1]

+dynamizer «Property» *

«FeatureType»
Core::AbstractDynamizer

+dynamizer «Property»

+dynamizer «Property»
1

AbstractPhysicalSpace
«FeatureType»
Core::AbstractOccupiedSpace

GM_Primitive
«type»
Geometric primitive::GM_Point

+position «Property»
0..1

+demands «Property» 0..*

«DataType»
ADEOfAbstractCityObject

(from Core)

«DataType»
EnergyADECityObjectProperties

+weatherData «Property»
0..*

«FeatureType»
WeatherData

«Property»
+ weatherDataType: WeatherDataTypeValue
+ values: Measure

values requires to be referenced by Dynamizer::AbstractTimeseries

«DataType»
ADEOfAbstractBuilding

(from Building)

+aggregatedBuildingLayering «Property»

«FeatureType»
AbstractLayeredMaterial

0..1

AbstractFeature
«FeatureType»
Core::AbstractFeatureWithLifespan

«DataType»
BuildingProperties

«Property»
+ buildingType: BuildingTypeValue [0..1]
+ constructionWeight: ConstructionWeightValue [0..1]
+ energyPerformanceCertification: EnergyPerformanceCertification [0..*]
+ isLandmarked: Boolean [0..1]
+ refurbishmentMeasure: RefurbishmentMeasure [0..*]

0..*
1
+thermalZone «Property»

«FeatureType»
AbstractThermalZone

+contains «Property»
0..1
0..*

0..*
1
+usageZone «Property»

«FeatureType»
AbstractUsageZone

AbstractLogicalSpace
«FeatureType»
Building::AbstractBuildingSubdivision

«enumeration»
ConstructionWeightValue

veryLight
light
medium
heavy

«enumeration»
EndUseTypeValue

cooking
domesticHotWater
electricalAppliances
lighting
otherOrCombination
spaceCooling
spaceHeating
ventilation
process

«CodeList»
EnergyCarrierTypeValue

+ chilledAir
+ chilledWater
+ coal
+ electricity
+ fuelOil
+ hotAir
+ hotWater
+ naturalGas
+ propane
+ steam
+ woodChips
+ woodPallets

«CodeList»
BuildingTypeValue

+ apartmentBlock
+ multiFamilyHouse
+ singleFamilyHouse
+ terracedHouse

«DataType»
RefurbishmentMeasure

«Property»
+ date: DateOfEvent
+ level: RefurbishmentClassValue
+ description: CharacterString [0..1]

«enumeration»
WeatherDataTypeValue

airTemperature
humidity
windSpeed
cloudiness
globalSolarIrradiance
directSolarIrradiance
diffuseSolarIrradiance
terrestrialEmission
downwardTerrestrialRadiation
daylightIlluminance

«Union»
DateOfEvent

«Property»
+ instant: TM_Position
+ period: TM_Period

«CodeList»
RefurbishmentClassValue

+ advanced
+ norefurbishment
+ standard

«DataType»
EnergyPerformanceCertification

«Property»
+ rating: CharacterString
+ name: CharacterString
+ certificationId: CharacterString [0..1]

«DataType»
ServiceLife

«Property»
+ startOfLife: TM_Position [0..1]
+ lifeExpectancy: TM_IntervalLength [0..1]
+ mainMaintenanceInterval: TM_IntervalLength [0..1]

Core::Address «FeatureType» — *AbstractFeature*

Building::AbstractBuildingSubdivision «FeatureType» — *AbstractLogicalSpace*

ADEOfBuildingUnit «DataType» *(from Building)*

Building::BuildingUnit «FeatureType»

AbstractUsageZone «FeatureType»

AbstractThermalZone «FeatureType»

+address «Property» *
*
+contains «Property»
0..* 0..1

BuildingUnitOccupancy «DataType»

«Property»
+ numberOfRooms: Integer [0..1]
+ ownerName: CharacterString [0..1]
+ ownershipType: OwnershipTypeValue [0..1]
+ energyPerformanceCertification: EnergyPerformanceCertification [0..*]

+contains «Property» 0..*

UsageZone «FeatureType»

«Property»
+ coolingSchedule: AbstractSchedule [0..1]
+ heatingSchedule: AbstractSchedule [0..1]
+ usageZoneType: CurrentUseValue
+ usedFloors: IntegerList [0..1]
+ ventilationSchedule: AbstractSchedule [0..1]
+ averageInternalGains: HeatExchangeType [0..1]

1

0..1 0..1

0..1

+equippedWith «Property» 0..*

AbstractOccupiedSpace «FeatureType» **Facilities**

«Property»
+ operationSchedule: AbstractSchedule [0..1]
+ heatDissipation: HeatExchangeType [0..1]

+equippedWith «Property» 0..*

+occupiedBy «Property» 0..*

Occupants «FeatureType» — *AbstractFeatureWithLifespan*

«Property»
+ heatDissipation: HeatExchangeType [0..1]
+ numberOfOccupants: Integer [0..1]
+ occupancyRate: AbstractSchedule [0..1]
+ occupantType: OccupantTypeValue [0..1]

+occupiedBy «Property» 0..*

1

+household «Property» 0..*

Household «FeatureType» — *AbstractFeatureWithLifespan*

«Property»
+ residenceType: ResidenceTypeValue [0..1]
+ householdType: HouseholdTypeValue [0..1]

DHWFacilities «FeatureType»

«Property»
+ numberOfBaths: Integer [0..1]
+ numberOfShowers: Integer [0..1]
+ numberOfWashBasins: Integer [0..1]
+ waterStorageVolume: Volume [0..1]

ElectricalAppliances «FeatureType»

«Property»
+ electricalPower: Measure [0..1]

LightingFacilities «FeatureType»

«Property»
+ electricalPower: Measure [0..1]

HeatExchangeType «DataType»

«Property»
+ convectiveFraction: Scale [0..1]
+ latentFraction: Scale [0..1]
+ radiantFraction: Scale [0..1]
+ totalValue: Measure

OwnershipTypeValue «CodeList»

«Property»
+ corporation
+ government
+ nonOccupantPrivateOwner
+ nonProfitOrganisation
+ occupantPrivateOwner
+ propertyManagementCompany
+ otherOrCombination

CurrentUseValue «CodeList»

Core::OccupantTypeValue «CodeList»

residents, workers, students, patients, visitors, othersOrCombination

HouseholdTypeValue «enumeration»

loneAdult
multiFamily
oneFamily
pensionerCouple
unrelatedAdults
vacant
workerCouple

ResidenceTypeValue «enumeration»

mainResidence
secondaryResidence
vacant

AbstractOccupiedSpace

«FeatureType»
AbstractEnergySystem

«Property»
+ numberOfDevices: Integer [0..1]
+ model: CharacterString [0..1]
+ serviceLife: ServiceLife [0..1]

AbstractFeatureWithLifespan

«FeatureType»
SystemOperation

«Property»
+ endUse: EndUseTypeValue
+ operationTime: AbstractSchedule [0..1]
+ yearlyGlobalEfficiency: Decimal [0..1]

+has
«Property»
0..*   1

«FeatureType»
AbstractEnergyConversionSystem

«Property»
+ efficiencyIndicator: CharacterString [0..1]
+ installedPower: Measure [0..1]
+ nominalEfficiency: Measure [0..1]

«FeatureType»
AbstractStorageSystem

+isProvidedBy
«Property»   0..*

«FeatureType»
AbstractEnergyDistributionSystem

«Property»
+ distributionPerimeter: DistributionTypeValue [0..1]

+isDistributedBy
«Property»   0..*

+distributes
«Property»

0..*

0..*
+isStoredBy
«Property»

AbstractFeatureWithLifespan

«FeatureType»
EnergyFlow

«Property»
+ energyAmount: Measure
+ energyCarriertype: EnergyCarrierTypeValue [0..1]

0..*
+provides
«Property»

AbstractFeatureWithLifespan

«FeatureType»
Core::AbstractDynamizer

+dynamizer
«Property»
1

energyAmount requires to be referenced by Dynamizer::AbstractTime series

0..*
+stores
«Property»

+emitts
«Property»   0..*

+isEmittedBy
«Property»   0..*

«enumeration»
EmitterTypeValue

radiator
convector
radiantFloor
radiantCeiling
radiantWall
splitUnit
2PipesFanCoilUnit
4PipesFanCoilUnit

«enumeration»
DistributionTypeValue

building
dwelling
groupOfBuildings
room
staircase
storey

«FeatureType»
EnergySource

«Property»
+ co2EmissionFactor: Measure
+ energyDensity: Measure [0..1]
+ primaryEnergyFactor: Measure

«FeatureType»
EmitterSystem

«Property»
+ emitterType: EmitterTypeValue [0..1]
+ installedPower: Measure [0..1]
+ thermalExchange: HeatExchangeType [0..1]

AbstractOccupiedSpace

«FeatureType»
AbstractEnergySystem

«Property»
+ numberOfDevices: Integer [0..1]
+ model: CharacterString [0..1]
+ serviceLife: ServiceLife [0..1]

«FeatureType»
AbstractEnergyDistributionSystem

«Property»
+ distributionPerimeter: DistributionTypeValue [0..1]

«FeatureType»
AbstractStorageSystem

«FeatureType»
ThermalDistributionSystem

«Property»
+ isCirculation: Boolean [0..1]
+ medium: MediumTypeValue [0..1]
+ nominalFlow: Measure [0..1]
+ returnTemperature: Measure [0..1]
+ supplyTemperature: Measure [0..1]
+ thermalLossesFactor: Measure [0..1]

«FeatureType»
PowerDistributionSystem

«Property»
+ current: Measure [0..1]
+ voltage: Measure [0..1]

«FeatureType»
ThermalStorageSystem

«Property»
+ preparationTemperature: Measure [0..1]
+ medium: MediumTypeValue [0..1]
+ thermalLossesFactor: Measure [0..1]
+ storageVolume: Volume [0..1]

«FeatureType»
PowerStorageSystem

«Property»
+ batteryTechnology: CharacterString [0..1]
+ powerCapacity: Measure [0..1]

«enumeration»
MediumTypeValue

air
steam
water

AbstractFeature
«FeatureType»
Core::AbstractFeatureWithLifespan

«FeatureType»
AbstractSchedule

+dynamizer
«Property»
0..1

«FeatureType»
Core::AbstractDynamizer

«FeatureType»
Core::AbstractCityObject

+dynamizer
«Property»
*

ConstantValueSchedule
«FeatureType»

«Property»
+ averageValue: Measure

DualValueSchedule
«FeatureType»

«Property»
+ usageHoursPerDay: Decimal [0..1] = 24
+ usageDaysPerYear: Decimal [0..1] = 365
+ usageValue: Measure
+ idleValue: Measure

DailyPatternSchedule
«FeatureType»

«Property»
+ timeDependingValues: Decimal

timeDependingValues
requires to be referenced
by
Dynamizer::AbstractTime
series

TimeseriesSchedule
«FeatureType»

«Property»
+ timeDependingValues: Decimal

timeDependingValues
requires to be referenced
by
Dynamizer::AbstractTime
series

«enumeration»
WeatherDataTypeValue

airTemperature
humidity
windSpeed
cloudiness
globalSolarIrradiance
directSolarIrradiance
diffuseSolarIrradiance
terrestrialEmission
downwardTerrestrialRadiation
daylightIlluminance

«DataType»
ADEOfAbstractCityObject

(from Core)

«DataType»
EnergyADECityObjectProperties

AbstractPhysicalSpace
«FeatureType»
Core::AbstractOccupiedSpace

«FeatureType»
WeatherStation

«Property»
+ stationName: CharacterString [0..1]

+weatherData
«Property» 0..*

AbstractFeatureWithLifespan
«FeatureType»
WeatherData

«Property»
+ weatherDataType: WeatherDataTypeValue
+ values: Measure

+position
«Property»
0..1

GM_Primitive
«type»
Geometric primitive::
GM_Point

values requires to be referenced by Dynamizer::AbstractTime series

+dynamizer
«Property» 1

AbstractFeatureWithLifespan
«FeatureType»
Core::AbstractDynamizer