

Concrete application case of CitySim

Presentation for the CityGML Energy ADE Workshop in Munich

Dr Jérôme Kämpf^{1,2}

Silvia Coccolo^{1,2}

jerome.kaempf@epfl.ch

silvia.coccolo@epfl.ch



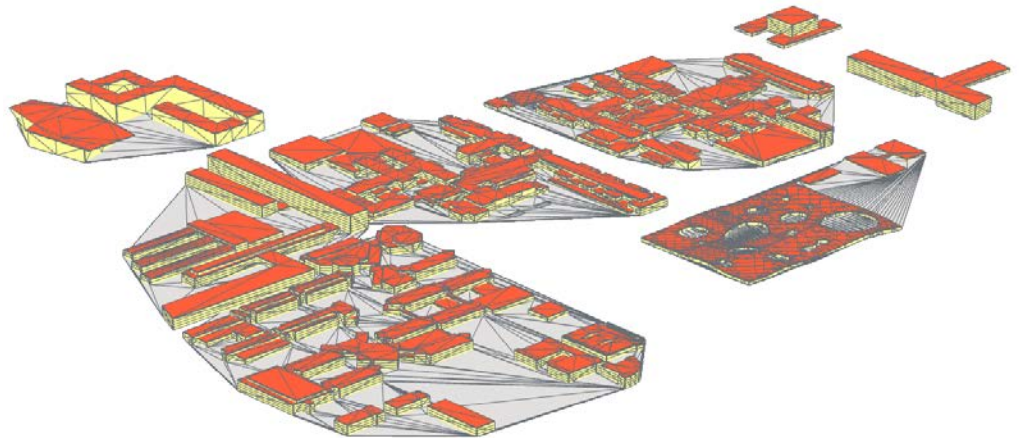
^{1,2}Solar Energy and Building Physics Lab, EPFL
kaemco LLC

Introduction

- *CitySim Solver*
- *CitySim Pro*

Export in CityGML Energy ADE

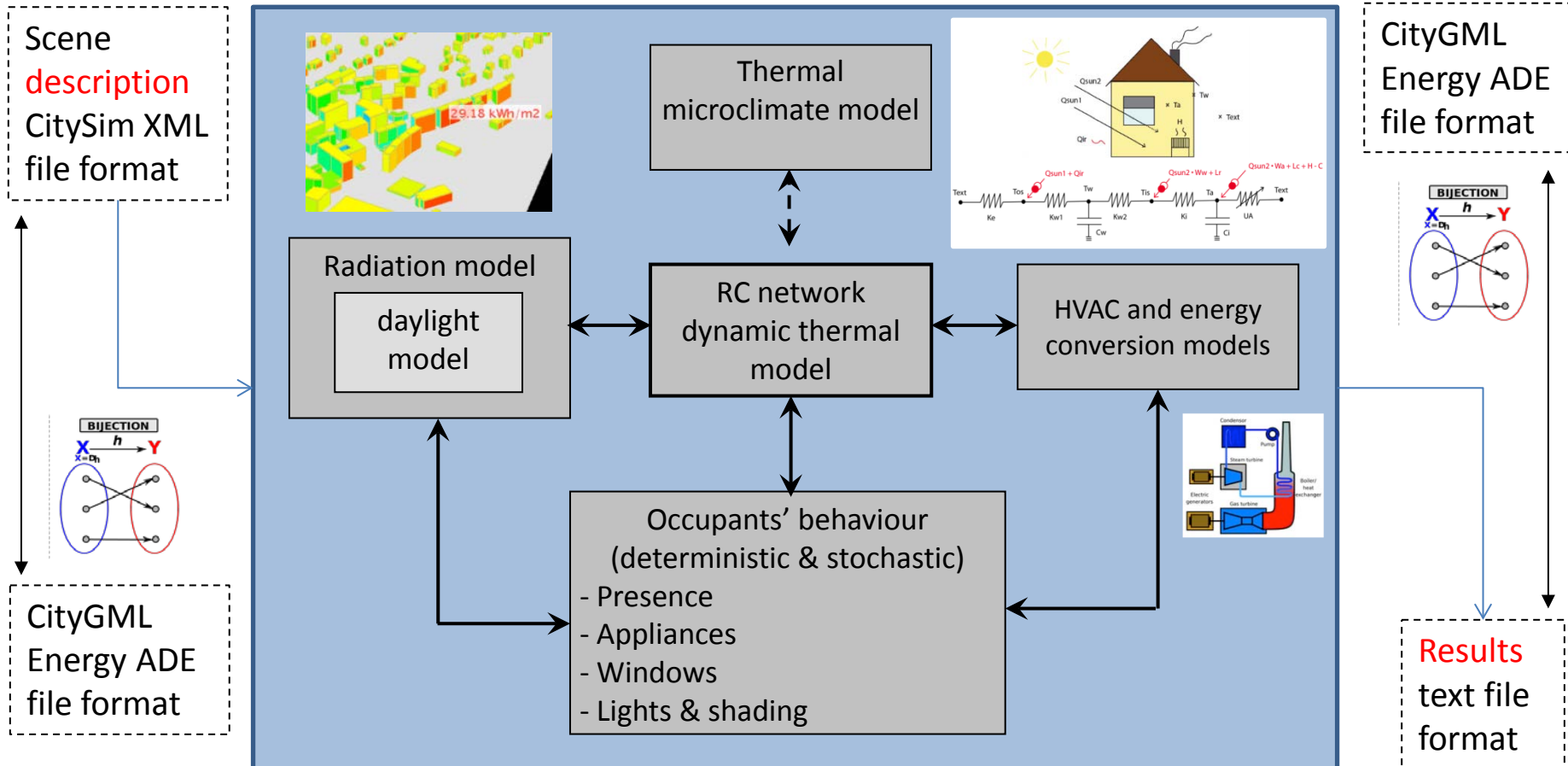
- *Current export feature*
- *Comments on practical side*
- *Example provided for the Quartier Nord of EPFL*



Introduction CitySim Solver

“A trade-off between accuracy, input data and computing time”

The program developed at EPFL (2009-) for researchers

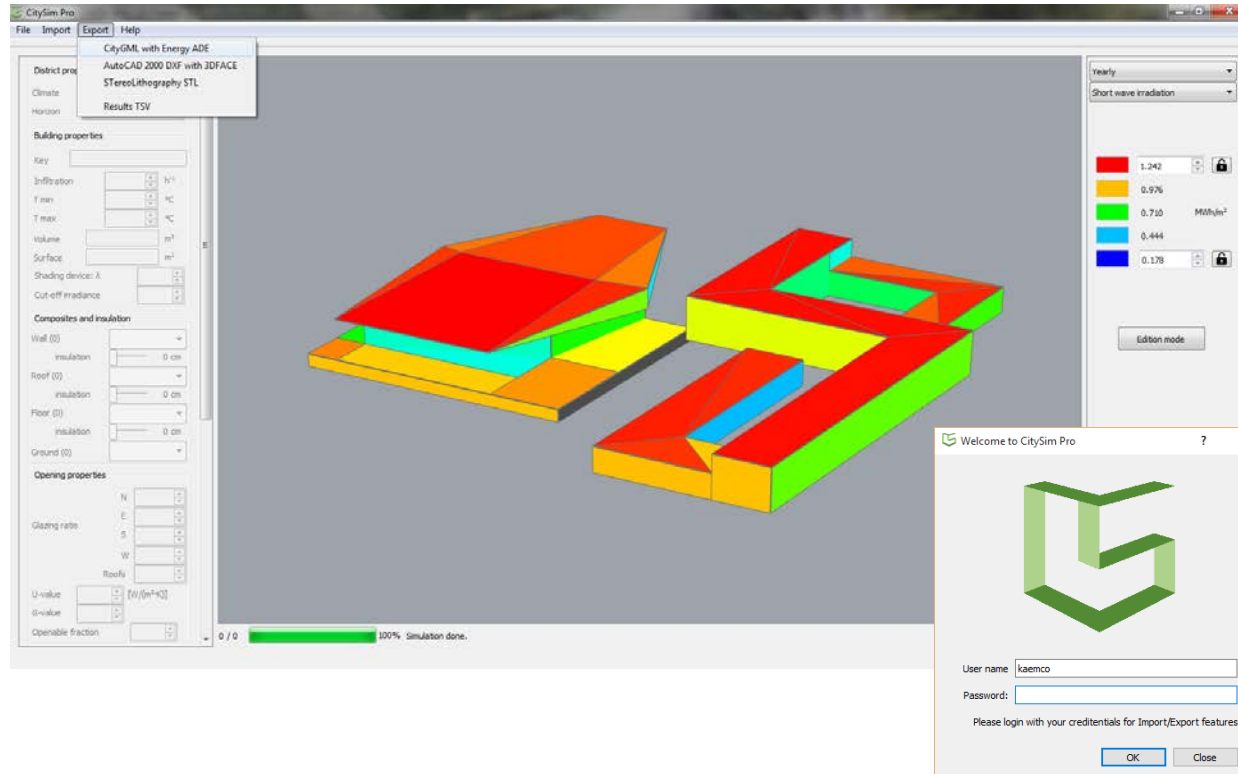


Introduction

CitySim Pro



The graphical user interface developed by kaemco for researchers and practitioners



α-version available

User's agreement

Temporary access
for the workshop:

Username
try{1,2, 3, 4, 5}

Password
try{1, 2, 3, 4, 5}

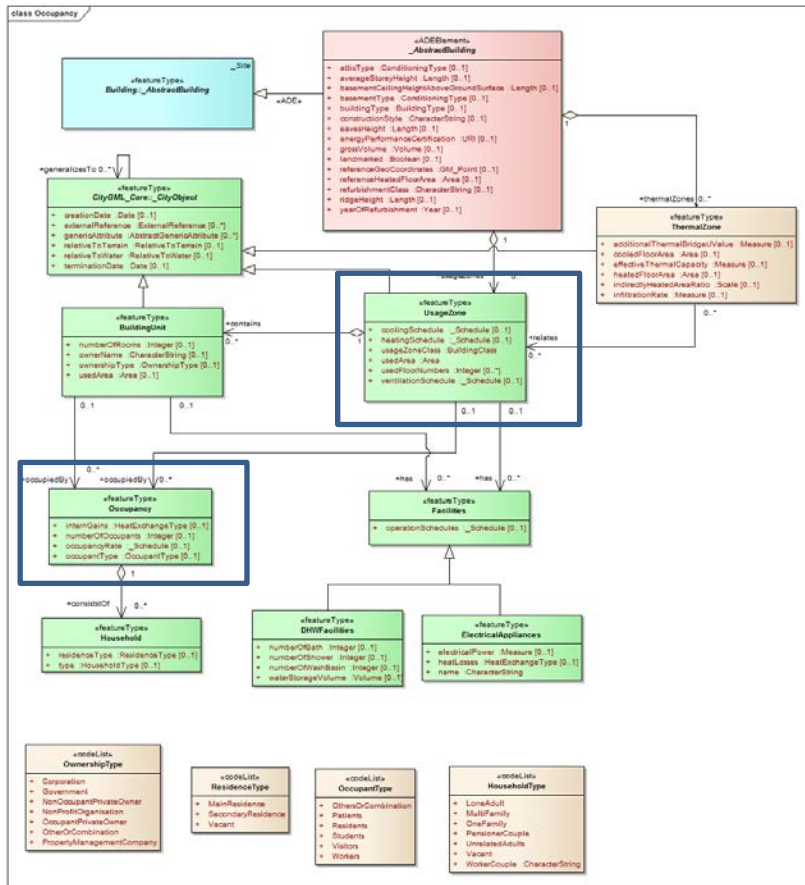
kaemco's FTP server: <ftp://kaemco.synology.me/CitySimPro>



Export in CityGML Energy ADE

Current export feature

The usage zones export and link to boundary surfaces



```
</energy:composedOf>
<energy:correspondsTo xlink:href="#b3_p_g_44"/>
</energy:ThermalBoundarySurface>
</energy:boundedBy>
<energy:relates xlink:href="#ID_3">
</energy:ThermalZone>
</energy:thermalZones>
<energy:usageZones>
<energy:UsageZone gml:id="ID_3">
<energy:coolingSchedule>
<energy:ScheduleLoD0>
<energy:averageValue uom="Temperature">22</energy:averageValue>
</energy:ScheduleLoD0>
</energy:coolingSchedule>
<energy:heatingSchedule>
<energy:ScheduleLoD0>
<energy:averageValue uom="Temperature">20</energy:averageValue>
</energy:ScheduleLoD0>
</energy:heatingSchedule>
<energy:ventilationSchedule>
<energy:ScheduleLoD0>
<energy:averageValue>0.00999999978</energy:averageValue>
</energy:ScheduleLoD0>
</energy:ventilationSchedule>
<energy:occupiedBy>
<energy:Occupancy>
<energy:numberOfOccupants>0</energy:numberOfOccupants>
</energy:Occupancy>
</energy:occupiedBy>
</energy:UsageZone>
</energy:usageZones>
<energy:energyDemands>
```

Heat gains:

- OccupancyRate to be extracted (stochastic)
- internGains vs ElectricalAppliances
 - totalValue → Schedule?

Export in CityGML Energy ADE

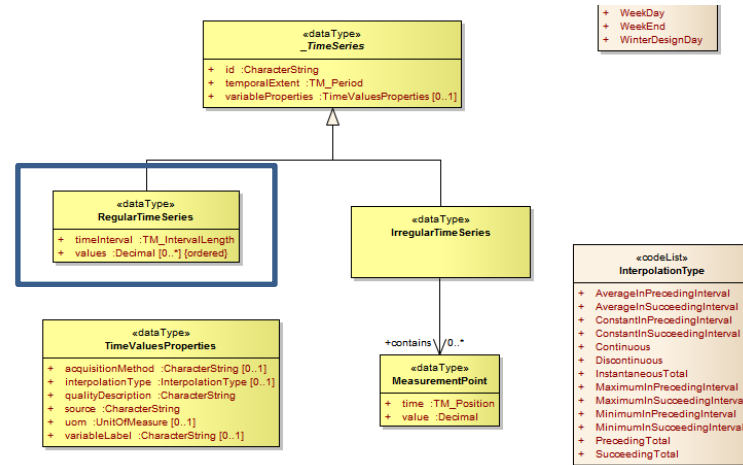
Comments on practical side



The graphical user interface developed by kaemco for researchers and practitioners

```
<energy:EnergyDemand>
  <energy:endUse>SpaceHeating</energy:endUse>
  <energy:energyAmount>
    <energy:RegularTimeSeries>
      <energy:timeInterval unit="hour">1</energy:timeInterval>
      <energy:values>96213.2812</energy:values>
      <energy:values>95898.6172</energy:values>
      <energy:values>95437.8906</energy:values>
      <energy:values>95096.5078</energy:values>
      <energy:values>94581.0391</energy:values>
      <energy:values>94462.5938</energy:values>
      <energy:values>94169.5625</energy:values>
      <energy:values>93890.5156</energy:values>
      <energy:values>91621.1406</energy:values>
      <energy:values>20192.4395</energy:values>
      <energy:values>0</energy:values>
      <energy:values>0</energy:values>
      <energy:values>0</energy:values>
      <energy:values>0</energy:values>
      <energy:values>0</energy:values>
      <energy:values>0</energy:values>
      <energy:values>0</energy:values>
      <energy:values>10109.8242</energy:values>
      <energy:values>71267.3672</energy:values>
      <energy:values>73343.7656</energy:values>
      <energy:values>75788.1953</energy:values>
      <energy:values>78316.2656</energy:values>
      <energy:values>80602.4453</energy:values>
      <energy:values>83225.9297</energy:values>
      <energy:values>85881.4844</energy:values>
      <energy:values>89726.9141</energy:values>
      <energy:values>91109.1641</energy:values>
      <energy:values>92508.7656</energy:values>
      <energy:values>94194.75</energy:values>
      <energy:values>95872.3359</energy:values>
      <energy:values>97216.2812</energy:values>
      <energy:values>98595.4141</energy:values>
      <energy:values>98127.3281</energy:values>
      <energy:values>73630.6719</energy:values>
    </energy:RegularTimeSeries>
  </energy:energyAmount>
</energy:EnergyDemand>
```

Redundancy repeating the values tag



- Space separation between values?
- Writing glazingRatio somewhere?
 - LOD2 import → compute the glazingRatio
 - LOD2 export → where to keep glazingRatio?



Export in CityGML Energy ADE

Example provided for the Quartier Nord of EPFL

The graphical user interface developed by kaemco for researchers and practitioners

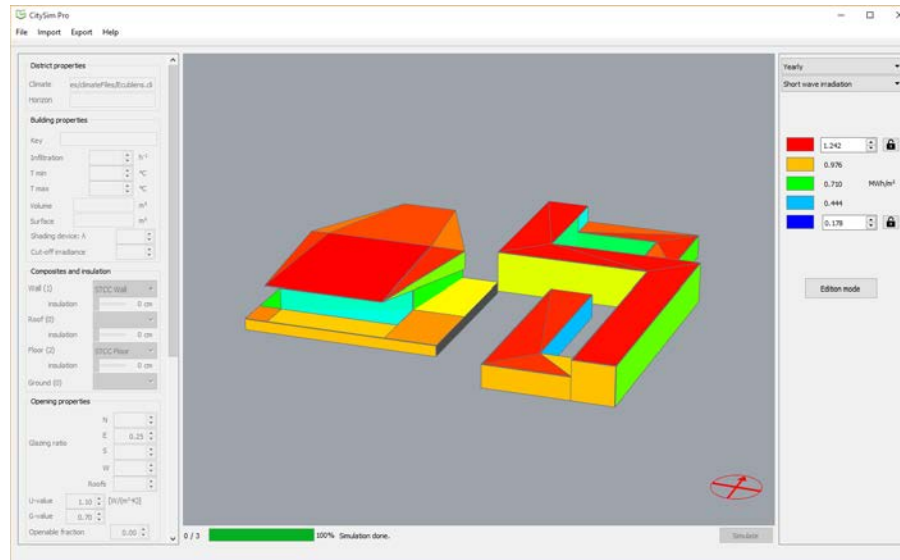
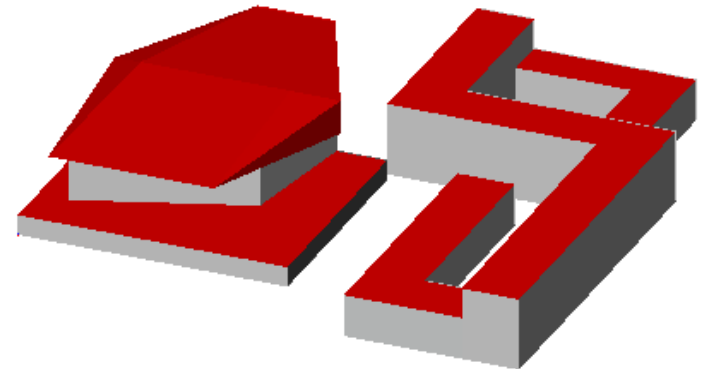


Illustration from FZK Viewer



kaemco's FTP server: <ftp://kaemco.synology.me/CitySimPro>

try{1,2,3,4,5}