Introduction

Methane Gas is an Environmental Issue

- It is an aggressive greenhouse gas
  - It traps heat in the atmosphere more than 20 times compared to carbon dioxide

- Where does it come from?
  - Natural sources 40%
  - Human related sources 60%

- Its content in the atmosphere is steadily increasing due to a growing population
  - Livestock and rice agriculture
  - Natural gas and petroleum production
  - Coal mining
  - Combustion
  - Landfills with organic waste materials

Land Surveying Education in Sweden

Märit Walfridsson
Director of studies
The University of Gävle

Cooperation with University of Botswana
Land Surveying – Academic Education in Sweden

- 5 Universities with Land surveying
- Stockholm and Lund with master of civil engineering

1 million people
9 million people

= 200 km

(The polar circle)
Academic education in Sweden – Land Surveying

The markets need for higher education is far above the supply

- Growing population, urbanisation, housing supply, lack of land resources in hot areas
- Need for deeper skills in some areas as well as overview
- Ongoing need for professionals further education
- Focus on sustainable development, democracy, ethics etc.
- Globalisation

Students

- Number of young people decreasing
- Unfamiliar branch of occupation
- Residents – no moving, no commuting
Curriculum Gävle – Land Surveying

On-going since 2009, 180 credits, 12 study periods, three year full-time

Two different education curriculums and both with two degrees, bachelor and engineer

- Land surveying
- Land management/Cadastral surveying

Two revised curriculums started 2015

- Only one degree each, bachelor
- Less mathematics
- Even more specialised tracks
- Management and development of the built environment
- International land administration (LM)
- Communication, professional personas/alt functions, processes (LM)
Curriculum Content
Land Surveying

Curriculum Content
Land Management
# Questions to be raised/discussed

<table>
<thead>
<tr>
<th>How long education?</th>
<th>Make courses available for professionals?</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 3/5 years?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The need for certain degree?</th>
<th>How to promote throughput?</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Engineering/bachelor?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mathematics needed?</th>
<th>How to promote quality and ongoing development?</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Advanced algebra, multidimensional analysis, statistics</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Different tracks</th>
<th>How to cooperate with adjacent study programmes?</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Land surveying, GIS, land management, real estate economics?</td>
<td>• HiG, other universities</td>
</tr>
</tbody>
</table>

| Distance courses/e-learning? | |
|-----------------------------| |
| • Quality, control, resources | |