Limburg Dross  Future Spatial Forms of Industrial Productive Landscapes
DROSS

Vacant space in the city which is a consequence of defunct economic and production systems or urban sprawl and could benefit from reprogramming.

According to Alan Berger:
“Adaptively reusing this waste landscape figures to be one of the twenty-first century’s great infrastructural design challenges.”
SITTARD-GELEEN

1860

1937

1965

2004

2009
size 1.963 ha
households 15.680
population 32.444

Geleen residents:
32.3% work in Geleen
19% work in Sittard
14.7% work in Parkstad Limburg
11.4% work in Maastricht
STAATSMIJN MAURITS
Staatsmijn Maurits
1926-1967
6,500 miners below ground
2,800 workers above ground
shaft depths:
341/455/548/660/810m

size 5.000 ha
jobs 10,000
length 180km
tons 7mil

45m
700,000,000 kWh/year
CHEMELOT
Chemelot

90+ companies

Research & Development
Start-up
Established Business
Service Provider

large chemical industrial complex

size 800 ha
jobs 6,500
visitors 1,000

Note: start years refer to years when production started. End years refer to closure in the cases of coal and coke, and sale in the case of plastics.
demarcated as “landscape” but its inaccessible...

no integration of campus into structure vision for 2020
chemelot in the background

no real edge condition

romantiscizing the site
2005 - NL
import
import
hydro
171
biomass
730
households
445.4
utilities
480.4
industry
1124.1
transport
732.5
import
generated electricity
871
heat
789.5
useable electricity
1806.2
lost electricity during generation or transport
lost electricity
5172
wind - sea
450
generators
geothermal
generators
wind - land
126
sun
216
tide & wave
34
industrial heat
39.5
natural gas
125
biorefinery
633
oil
230
2050 - NL
ELECTRICITY

40%
Limburg

NATURAL GAS

4-5%
Netherlands
TO CREATE A NEW SPATIAL COHESION

TO CHANGE THE RELATIONSHIP OF CHEMELOT TO THE CENTER OF GELEEN

TO CREATE A PRODUCTIVE PERFORMATIVE LANDSCAPE FROM WASTED SPACE
(that used to produce 700 million kWh/yr)

<table>
<thead>
<tr>
<th>ECOLOGICAL</th>
<th>SPATIAL</th>
<th>RECREATIONAL</th>
<th>PRODUCTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>phytoremediation</td>
<td>expand the green network of</td>
<td>connect existing paths</td>
<td>energy</td>
</tr>
<tr>
<td>phytodemarcation</td>
<td>the city</td>
<td></td>
<td>biomass</td>
</tr>
<tr>
<td></td>
<td>establish new civic space</td>
<td>add recreational space</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>for all age groups</td>
<td></td>
</tr>
</tbody>
</table>
CHEMELOT

- increase in campus quality will attract more companies
- greater connection to Geleen, feels less isolated
- chance to advertise changing practices to the world

RESIDENTS

- access to higher quality green space
- connection of walking routes in the area
- city park on their doorstep
- increase in housing values

GELEEN

- chance to redevelop a dying area
- attract new residents and businesses
- increase quality of life
- work towards a sustainable city
1. civic axis
   - Redvelop the industrial zone into new mixed use and civic space

2. campus and city
   - Reconnect the campus and the city to encourage exchange

3. fragmented landscapes
   - Connect vacant landscapes into one large system of productive and recreational spaces

4. city center
   - Remove highrise blocks replace with properly scaled mixed use to open up access to market

5. energy production
   - Use the site for energy production once again: rebuild on the former mining site
EXISTING SITUATION
CAMPUS EAST
ENERGY AXIS
WALKING ROUTES
BIOMASS FIELD DIVISION
INSPIRATION - mining maps
FAULT LINES AND COAL SEAMS
FAULT LINES AND COAL SEAMS
LANDSCAPE - faults
LANDSCAPE - axis extension
LANDSCAPE - axis shift
We tend to categorize our descriptions of nature into three types: the garden and park (first nature), agricultural lands and pastures (second nature), and wilderness (third nature).

1st nature: private gardens, city park
2nd nature: city orchard, meadows, biomass fields
3rd nature: CO2 compensation forest, agro-forest
1st nature - neighborhood park

2nd nature - biomass

3rd nature - coppice forest
MUNICIPALITY

MUNICIPALITY

transport facilitators
masterplan designers
companies
maintenance team

energy producers
researchers
employees
engineers

corporations
developers

business groups
housing corporations

business groups

land owners

planners

local initiatives

residents
maintenance team
EXISTING SITUATION - 2014
PHASE ONE - RELOCATION AND REMEDIATION - 2017
Swales to filter storm runoff

Transition between housing and landscape

City fruit and nut orchard

Meadows under powerlines with paths mown through
Plan of Burgemeester Lemmensstraat, existing and new housing, city orchard and meadow under power lines
EXISTING SITUATION
median one way road
bike path
parking and trees
sidewalk vacant lot

NEW SITUATION
median 1.70m
4.0m
1.5m
2.0m
3.0m
new house private garden
telephone storm sewer water main sewer
electricity gas hot and cold
district heating

one way road bike path parking and trees
swale
sidewalk new building
city orchard meadow mown path
EXISTING SITUATION
median one way road bike path parking and trees sidewalk

NEW SITUATION
median 1.70m 4.0m 1.5m 2.0m 3.0m
new house private garden Malus spp. Pyrus spp. Prunus spp. Juglans regia telephone storm sewer water main main sewer electricity gas hot and cold district heating

EXISTING SITUATION
median one way road bike path parking, swale and trees sidewalk

NEW SITUATION
median 1.70m 4.0m 1.5m 2.0m 3.0m new building city orchard meadow mown path
PHASE TWO - REALIGNMENT - 2020
Direct connection of the city to the park

Park with large trees - solitaires or groups

Wildflower meadows encircling lawns

Phytoremediation of polluted soils
Plan of the realigned Kampstraat with different developments, city park and phytoremediation field.
phyto extraction

- Helianthus annuus

phyto stabilization

- Brassica juncea
- Triticum aestivum

phyto degradation

- Armeria maritima
- Agropyron cristatum
- Populus deltoides

- Salix viminalis and others
PHASE THREE - RECONNECTION - 2025
White biotech field research

Biomass field harvest times and patterns

Ecological houtwal

Production forest
1st generation

Zea mays

Brassica napus

Beta vulgaris

Triticum estivum

2nd generation

Agroforestry-poplar, robinia, birch

Short rotation coppice-poplar, robinia, birch

Panicum virgatum

Miscanthus x giganteus
Transition from biomass fields, with axes formed by fault lines, through an ecological houtwal, to the production forest behind.
Zea mays
+2.0
Robinia pseudoacacia
Brassica napus
Zea mays
* all fields with maximum 6% slope
Triticum aestivum
Brassica napus
+1.0
1:1 slope
+0.0
+1.0
+2.0
+1.0
+0.0
-1.0
3 m

* all fields with maximum 6% slope
PHASE FOUR - REDEVELOPMENT COMPLETE - 2030
Water as a feature

Reflection of the hill in water

Campus path network and open space

Agrarian ideal
Plan showing the new Chemelot campus extension, OPAC reservoir and the edge of the biomass growing fields.
GOAL: 15% 500MW = 75MW = 657.000MWh/yr

SITE MAXIMUM: 349.800MWh/yr (53.24%)

OFF SITE REQUIREMENT: 307.200MWh/yr

corn and corn stover et al. biomass to produce 307.200MWh/yr need 4.388 more ha within 50km
or to produce 100.000 tons biomass (38 million liters ethanol) for economy of scale need 23.431ha or 10% of Limburg agricultural land within 50km

cheme lot
7.000 people

plastics and chemicals

130c water

15x 6MW turbines 245.000 MWh/yr

opac energy storage

production forests 125ha 2.050MWh/yr

DSM cellulosic ethanol facility biomass enzyme testing center

organica greenhouse waste water treatment 2 x 500m2 16.000 people

fruit and nut orchards

lindenhovel 10.000 people

on-site storm water filtration

BES Sittard 1,2MW elec 8MW heat

8MW geothermal 50,000 MWh/yr

ethanol 88.105 liters

turbine testing site 50.000 MWh/yr 15x 6MW turbines

Lindenheuvel 10.000 people

on-site storm water filtration

fruit and nut orchards