

System innovations

Cow Power

Alexandre Family EcoDairy

April 12. 2017

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Livestock Research

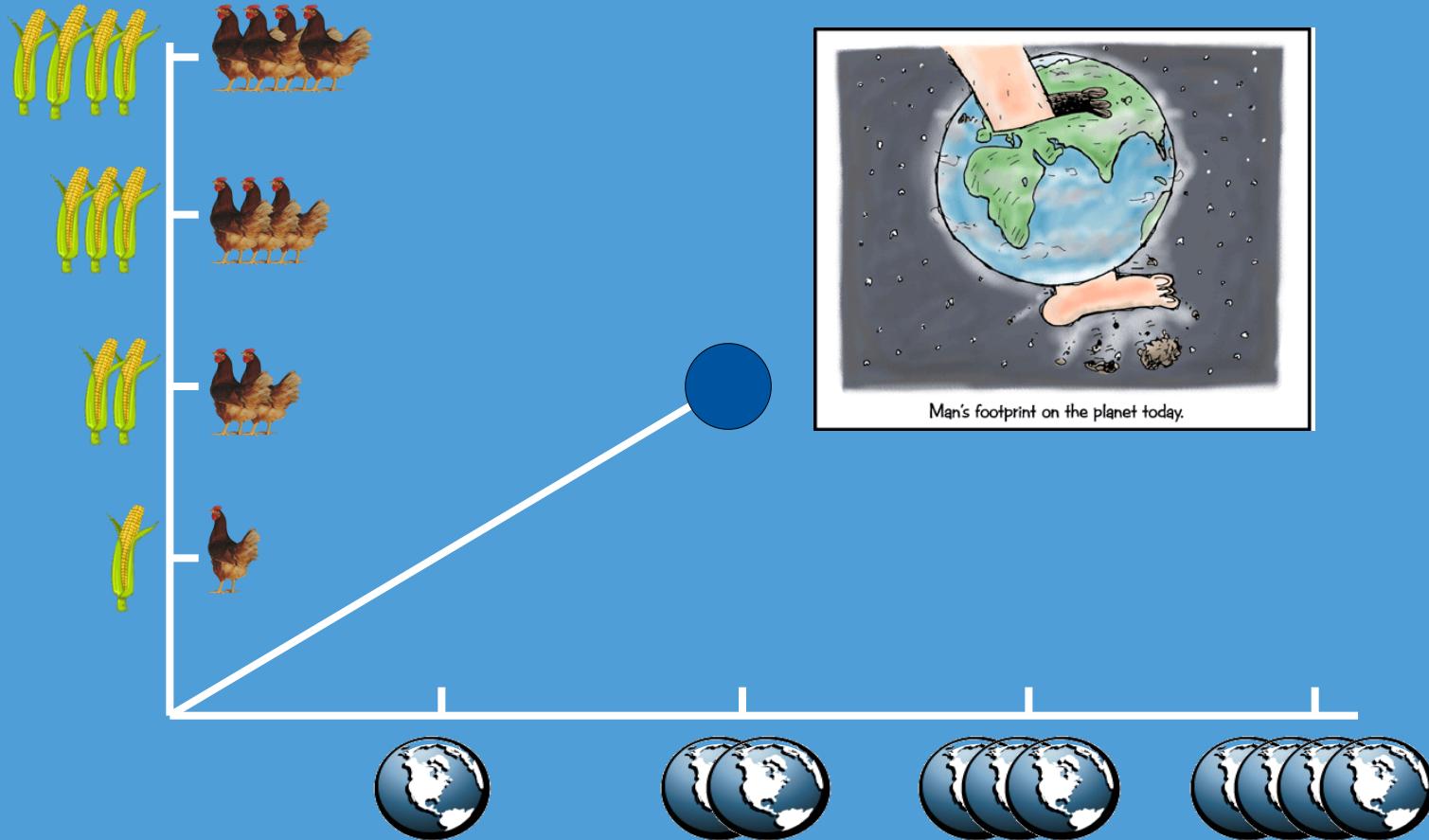




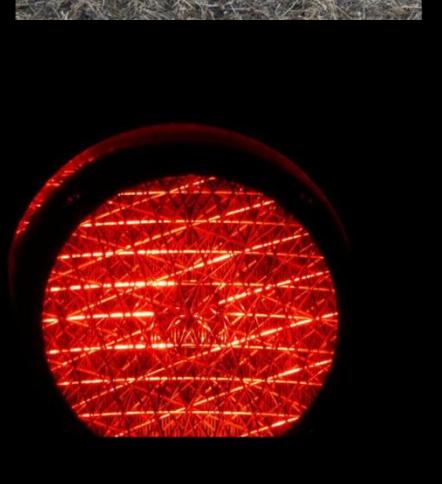
Earth overshoot day

- Earth Overshoot Day = the day we have used all the resources for that year
- 1992 → October 21
- 2002 → October 03
- 2012 → August 22
- 2014 → August 19
- 2016 → August 08

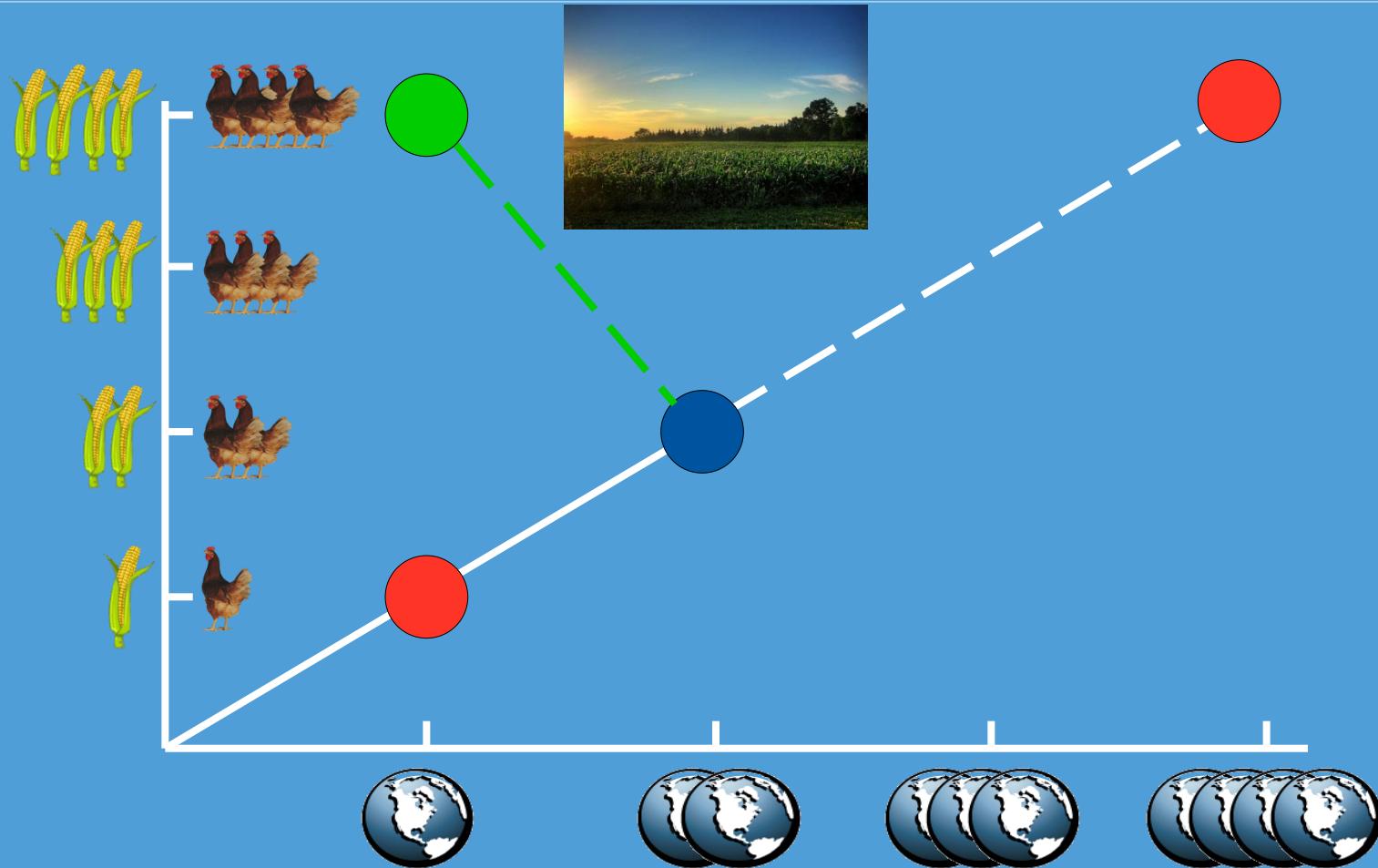
We are exceeding the carrying capacity







But we can make a shift in another direction



A double task is a challenge for all of us!!



*Feeding the world
within the carrying
capacity
of planet earth*



2 x 2

- Doubling Production
- Halving Ecological Footprint

Sustainability issues in Dutch dairy farming

■ Environment

- Local: manure surplus, ammonia, nitrate, dust; Global: climate change

■ Animal Welfare

■ Economy

- Profit & continuity
- Labor (quantity & quality)

■ Use of natural resources & biodiversity

- Global footprint, LCA, north-south relation
- Limited resources (energy, minerals)

■ Health (of man and animal)

- Veterinary risks; antibiotics and residues; hormones

■ Landscape

Dust concentrations and emissions: major concern in laying hen houses

- EU ban on battery cages > shift towards loose housing on litter floors > emissions of PM₁₀ in NL increased with a factor 17 (1995 to 2014) (Winkel et al., 2016)
- Effects on residents in farming areas: increased prevalence of pneumonia, lower lung function, more exacerbations and medicine use in COPD patients (Heederik et al., 2016)
- Animal welfare problem swapped for air quality problem! (Winkel et al., 2016; Proposition nr. 1)



Combating dust in laying hen houses by integrated system design

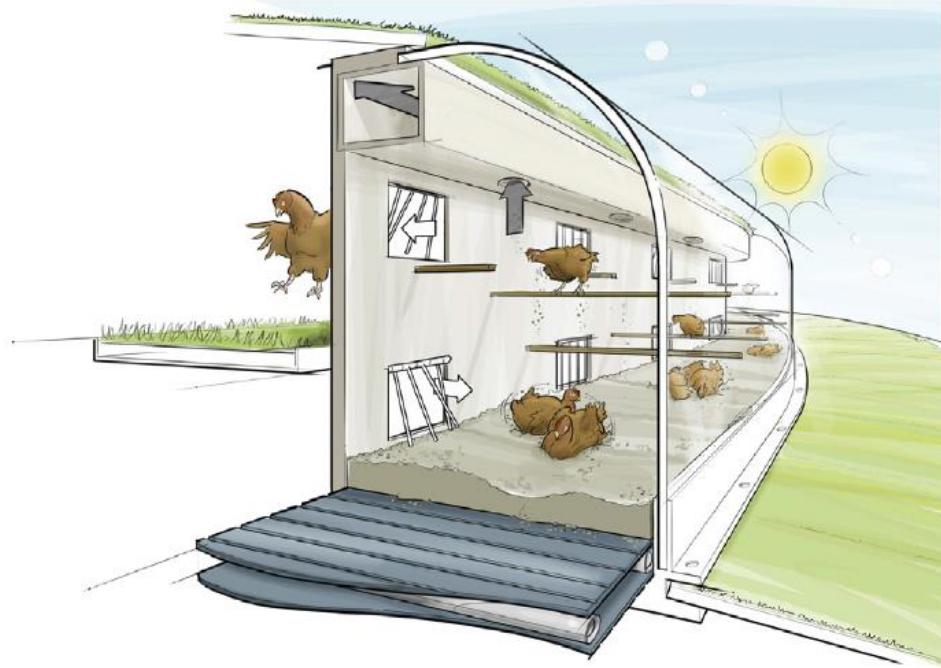
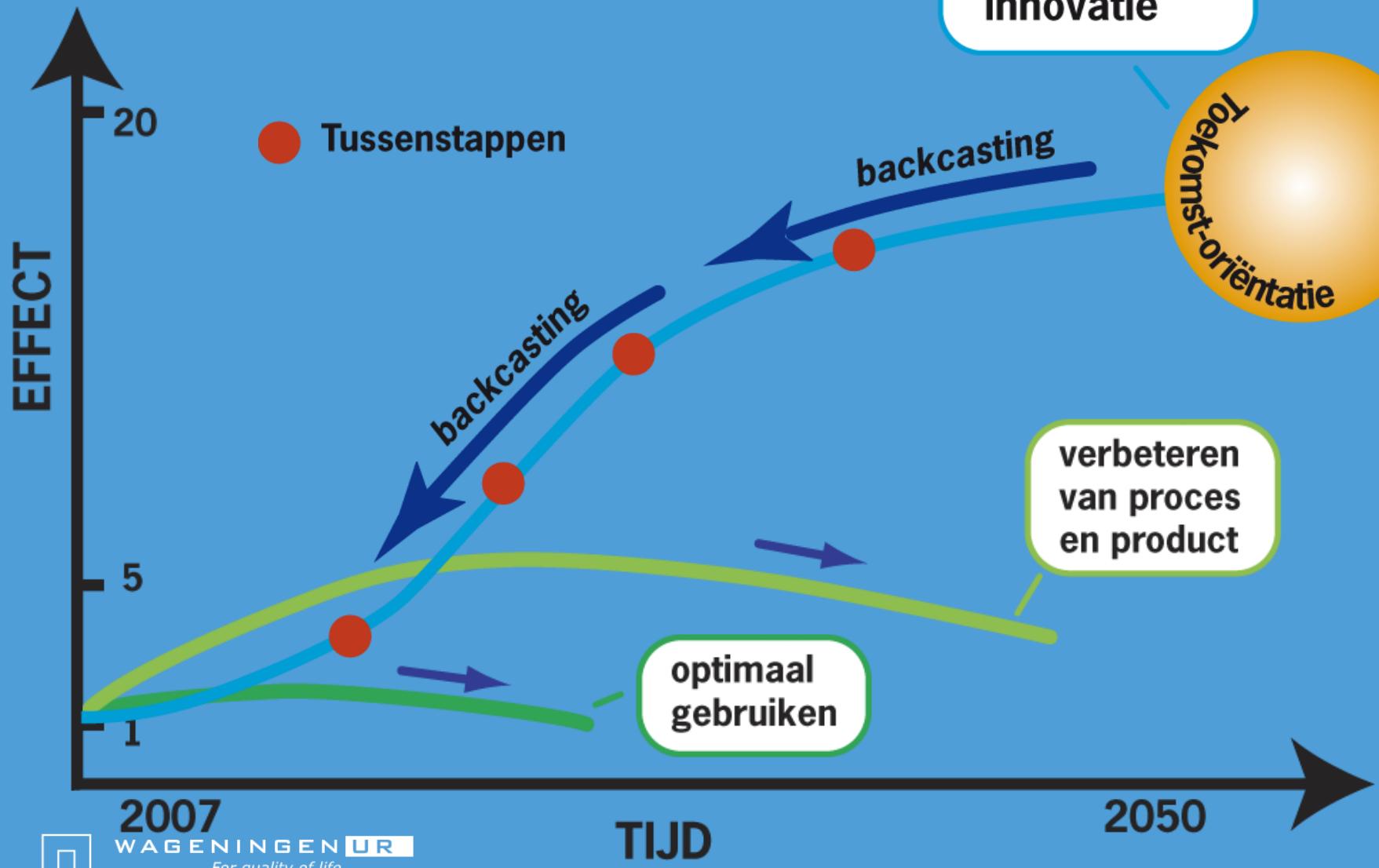


Fig. 2 – Dust bath unit for laying hens with one-way entrances to sand or turf on conveyor belts at the bottom, and perches that enable hopping to one-way exits in the top. Transparent walls let sunlight in and makes dust bath behaviour visible from the outside.

Source:

Van Weeghel et al. (2016). Involving the animal as a contributor in design to overcome animal welfare related trade-offs: The dust bath unit as an example. *Biosystems Engineering* 145:76-92.





Critical successfactors co-creation

- Knowing new roles of each other
- Respect for each other and roles
- Common goal, all actors active
- Common language
- Joint reflection and learning
- Continuous efforts in creating learning environment
- Needs more time and effort than expected, point of trouble
- Celebrate success



Dairy is our future



BoR dairy cow: some examples

- Number of resting places:
 - >1 per cow
- Freedom of movement & behaviour:
 - ≥ 360 m² per cow
 - Indoor and outdoor access
- Size of resting area
 - Free resting place (no obstacles)
- Floor type of walk ways
 - Friction, roughness, hardness

BoR Citizen / Consumer (critical elements)

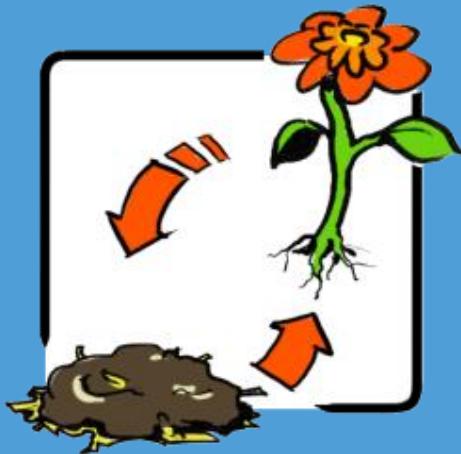
- Enough space for free movement of cows
- Animals well treated (like brother and sister)
- Feed is fresh and on natural basis
- Willing to pay little higher price for animal welfare
- Natural environment for animals
- Animal products (milk, meat) are tasty
- Fair and sustainable production process
- Professional attitude of farmers
- Enough margin for farmers, to make a good living
- Quality assurance by regulations / Q-programs

A. All needs of the cow



- Enough space all year round
- Enough resting place(s)
- Freedom of choices
- Sufficient floors
- Locomotion
- No stress treatments or injuries
- Enough feed / good quality

B. Minerals are useful products



- Use of plants
- No power of feed
- Separate feaces and urine
- No artificial fertilizer
- More organic drymatter and better quality of life in soil

C. Share €, labour and land



- Space for cow without an expensive stable
- Shared investments in milking parlour, machines, land, etc
- Co-operation
- Higher yield in grass- and cropproduction
- Energy production
- Higher quality of labour
- New functions

D. Soil is ecosystem



- Use organic drymatter in manure
- Intensivation and extensivation on the same farm
- Optimize management of N fertilizer (quantity, type of fertilizer, exact gifts at right place, etc)
- Minimize tillage
- No soil compression

De Meent

Jaarrond de ruimte

Een eenheid van 50 koeien

Het hele jaar de ruimte (360 m² per koe)

Drie verblijfsruimten ● plus weide ●

Welzijn: 95% van maximaal (Cowell)

Feces (vaste mest) en urine gescheiden houden

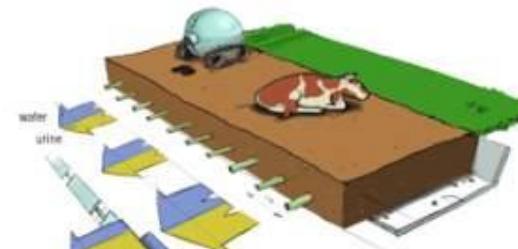
Ammoniakemissie 75% lager

20 m² zonnedak per koe

Economie: niet duurder



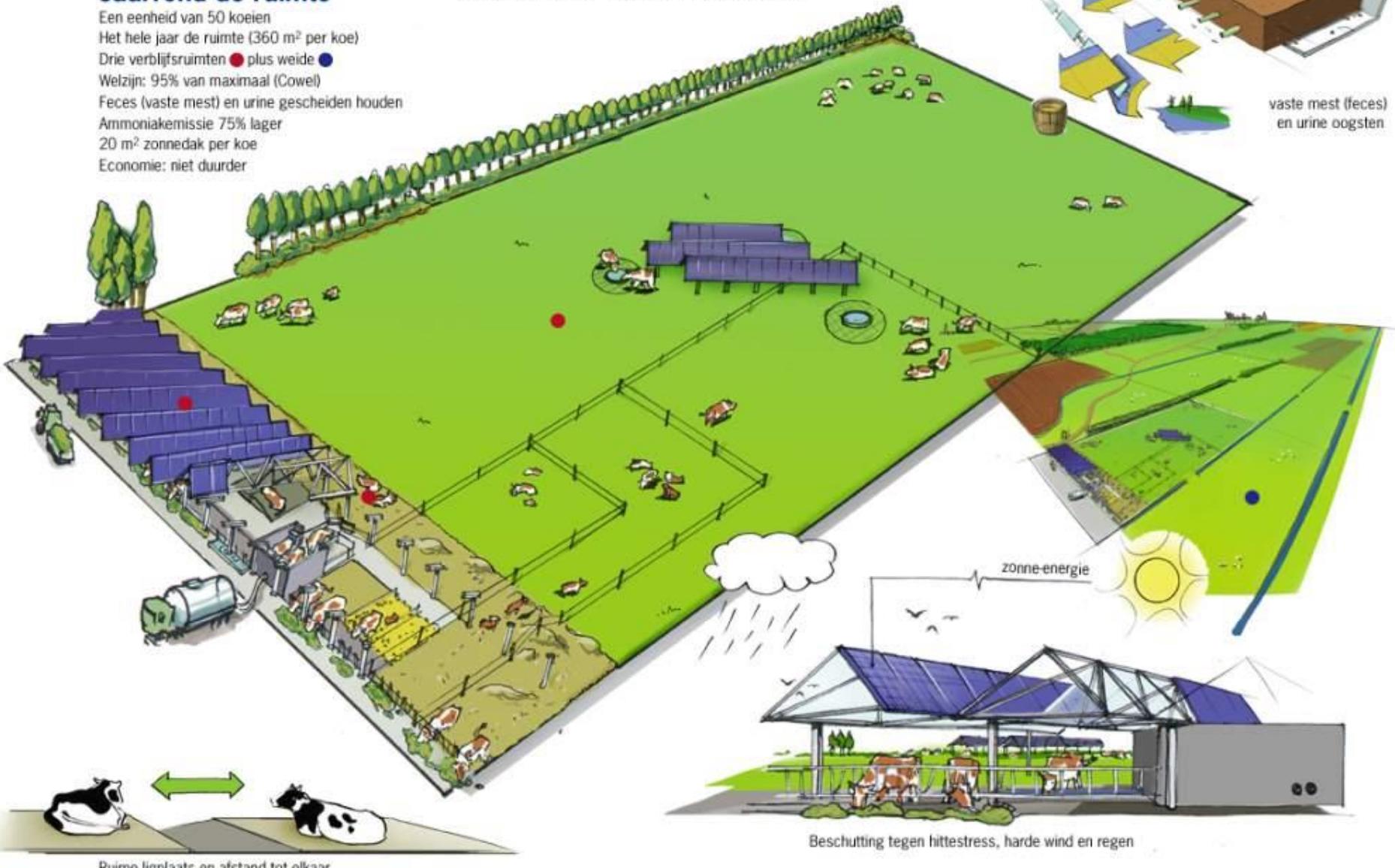
Ruimte voor beweging, vrije keuze en sociaal gedrag



water

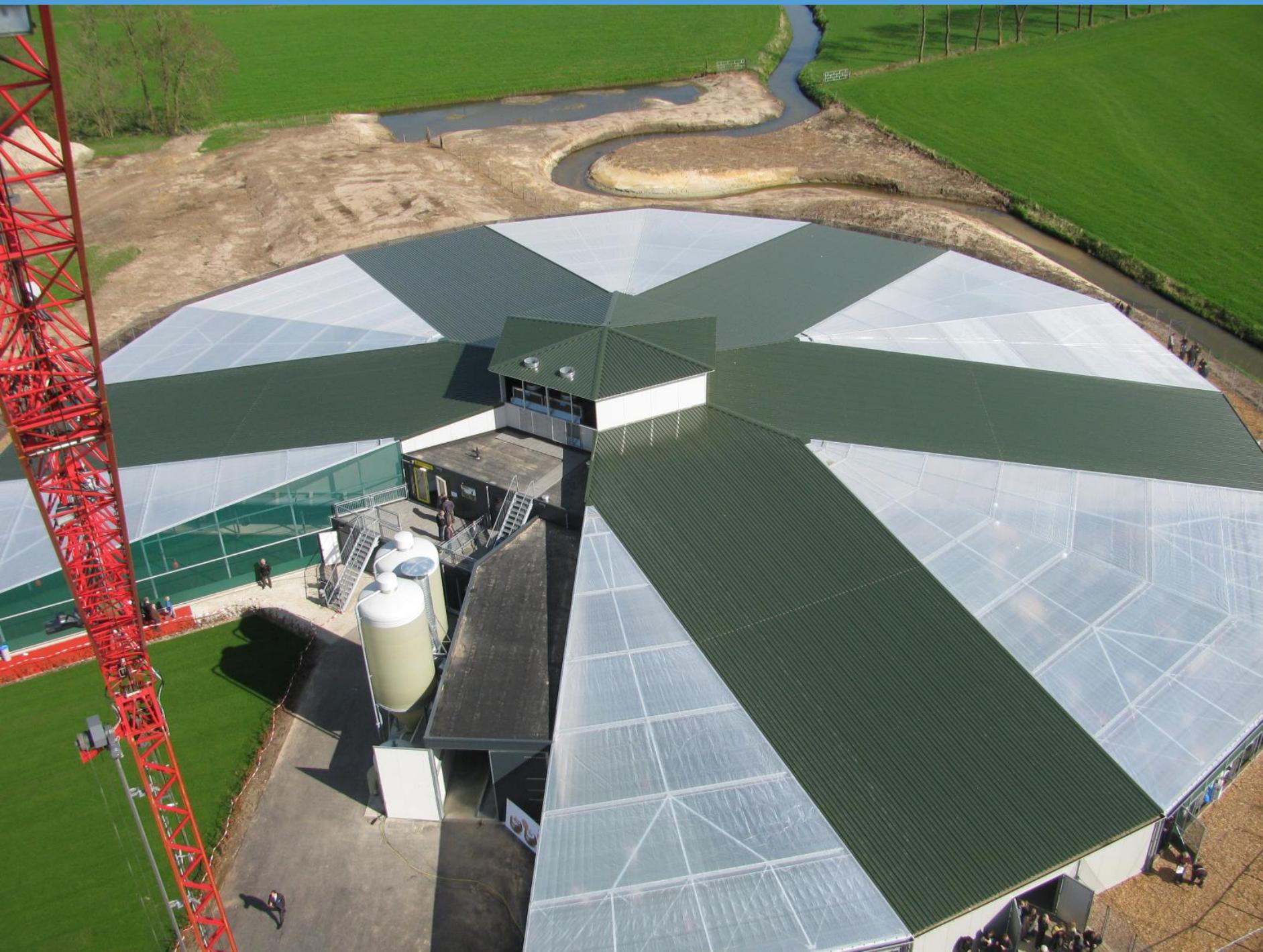
urine

vaste mest (feces)
en urine oogsten



Ruime ligplaats en afstand tot elkaar

Beschutting tegen hittestress, harde wind en regen





Windstreek









For quality of life

Cow Garden

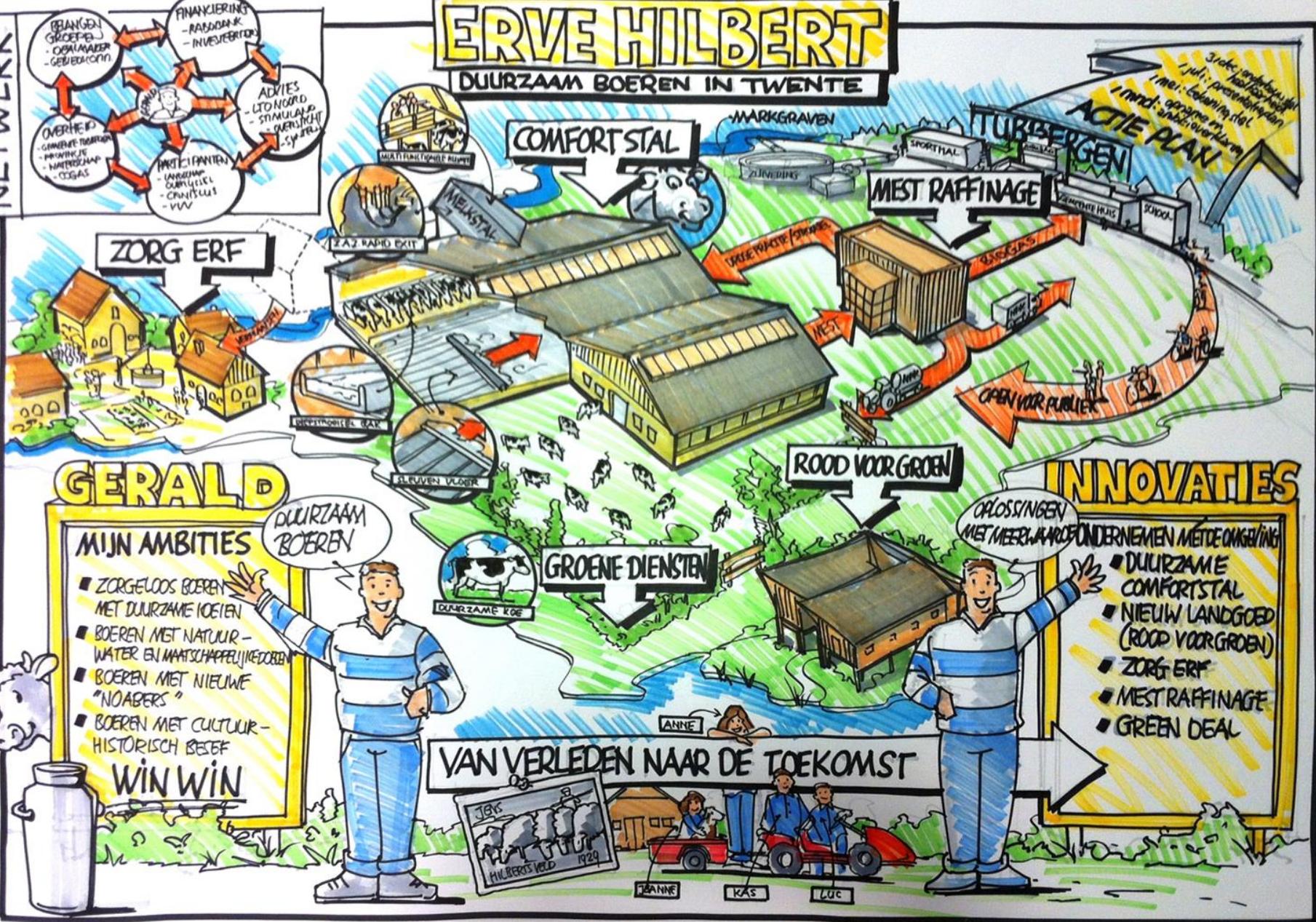


Cow Garden

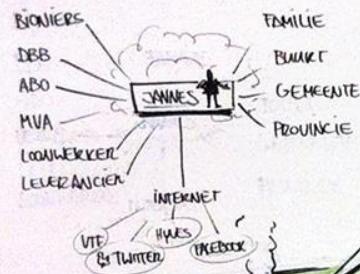


ERVE HILBERT

DUURZAAM BOEREN IN TWENTE

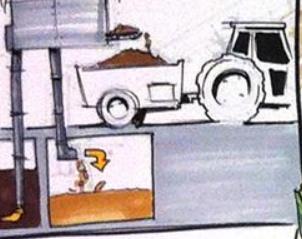


Frisian Forrest



HOUT GESTOCHTE CV

MESTSCHIEDER



AMBITIES

- MINERALEN KRINGLOOP SLUITEN
- NIEUWE COMBINATIELE STAL VOOR KOE & BOER
- MEER RENDEMENT MET DEZELFDE OMVANG
- DE KOE IN DE WEI Houden!



BODEMLEVEN VERBETEREN

Jannes & Familie



OPSLAG DUNNE FRACIE

MMM...!!
DAT LIGT LEKKER

TOEKOMST BESTENDIG BEDRIJF

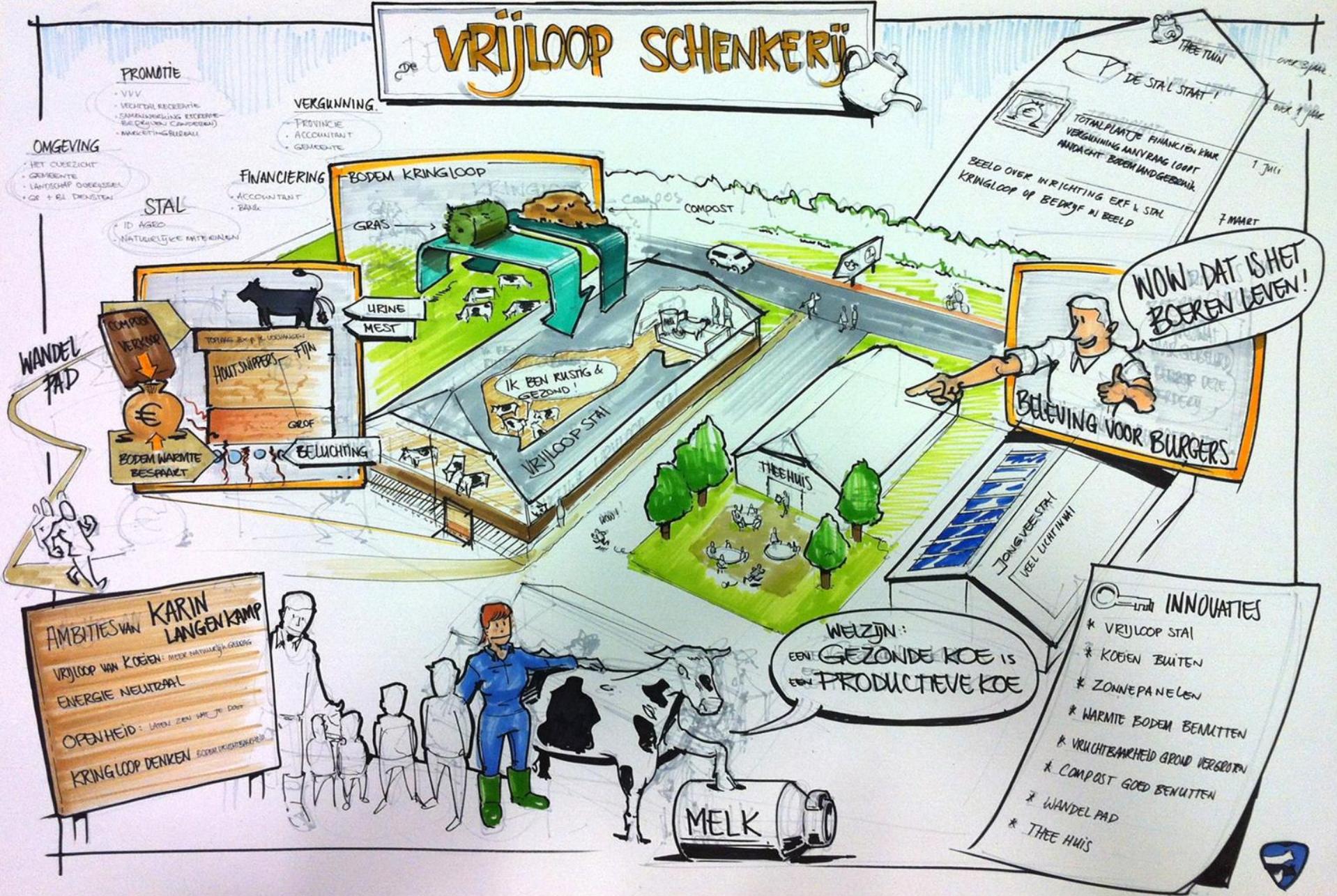


SLEUTEL INNOVATIES

- MEST Scheiden IN DUNNE FRACIE
- REGIONAAL KRINGLOOP SLUITEN
- DIKKE FRACIE ALS STROOISEL LAAG
- ZELFZUURZIENEND IN VOER DOOR BETTER GRAS-MANAGEMENT
- SUBSIDIE VOOR GROENE DIENST
- ONDERHOUD HOUTWALLEN DOOR VRJ-WILLIGERS EN SCHOLIEREN



De VRIJLOOP SCHENKERIJ







More information



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