

Progress Update



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Latest Update Pilot Arneco (Arnhem, NL) - urine

- Commissioning of the plant on site:
 - Permit requested and granted
 - Urine collection system installed, extra buffer placed for longer retention
 - Last process automation bugfixes processed
 - Analysis of collected urine
- Dissemination
 - Regional TV/Radio (Omroep Gelderland)
 - Dutch Process Technology Magazine (NPT) article





News coverage Pilot Arneco (Arnhem, NL) - urine

<https://www.gld.nl/nieuws/2457964/deze-mensen-hebben-een-eigen-kunstmestfabriek-in-de-achtertuin>

GEMEENTE ARNHEM

Deze mensen hebben een eigen kunstmestfabriek in de achtertuin

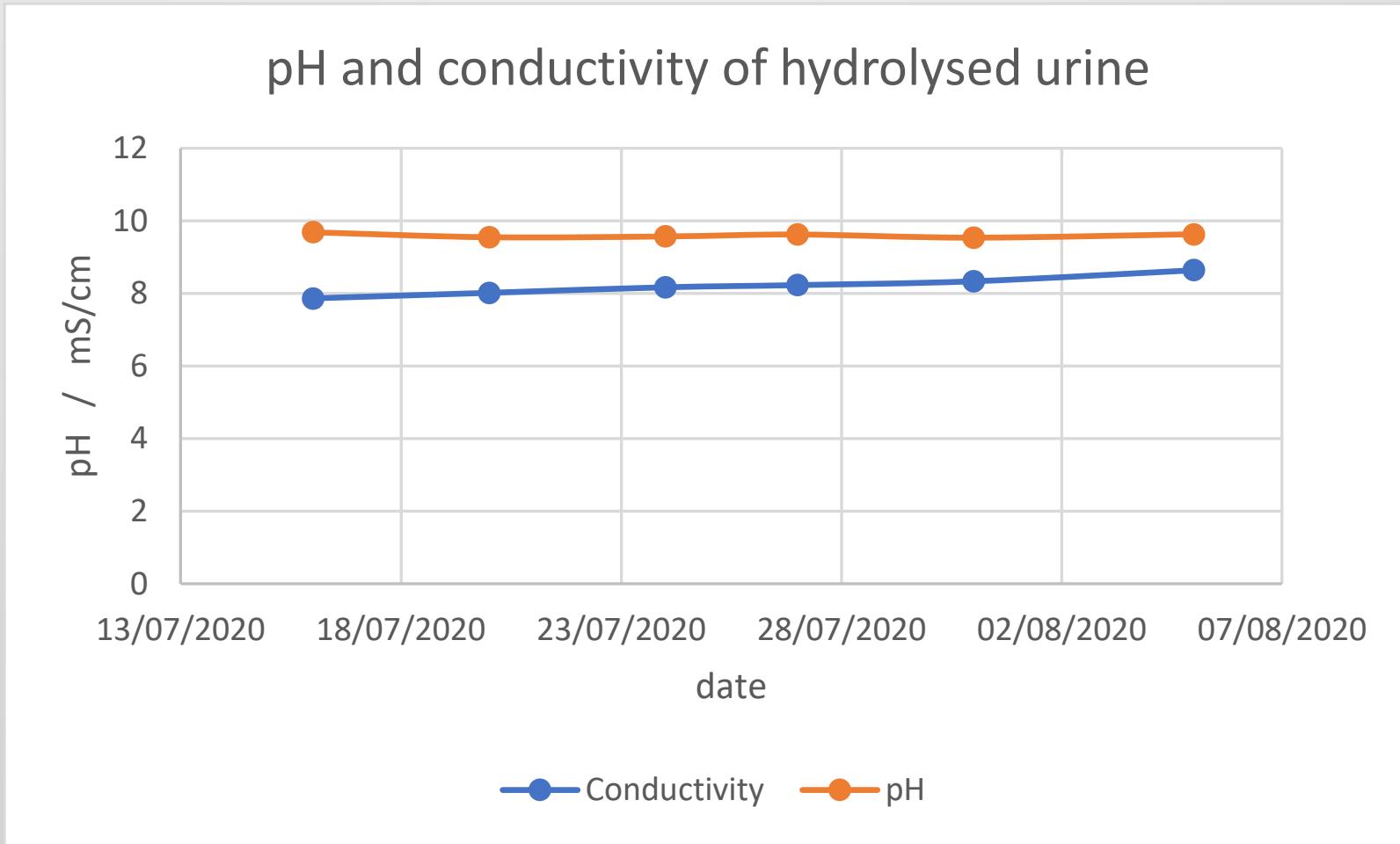
24 juli 2020, 11:30 • 2 minuten leestijd



Deze mensen hebben een eigen kunstmestfabriek in de achtertuin

ARNHEM - De Arnhemse woongemeenschap Arneco heeft een eigen kunstmestfabriek in de achtertuin. Het betreft een proefinstallatie die ammoniak wint uit de urine van de 15 huishoudens om daar kunstmest van te maken.

First results Pilot Arneco (Arnhem, NL) - urine

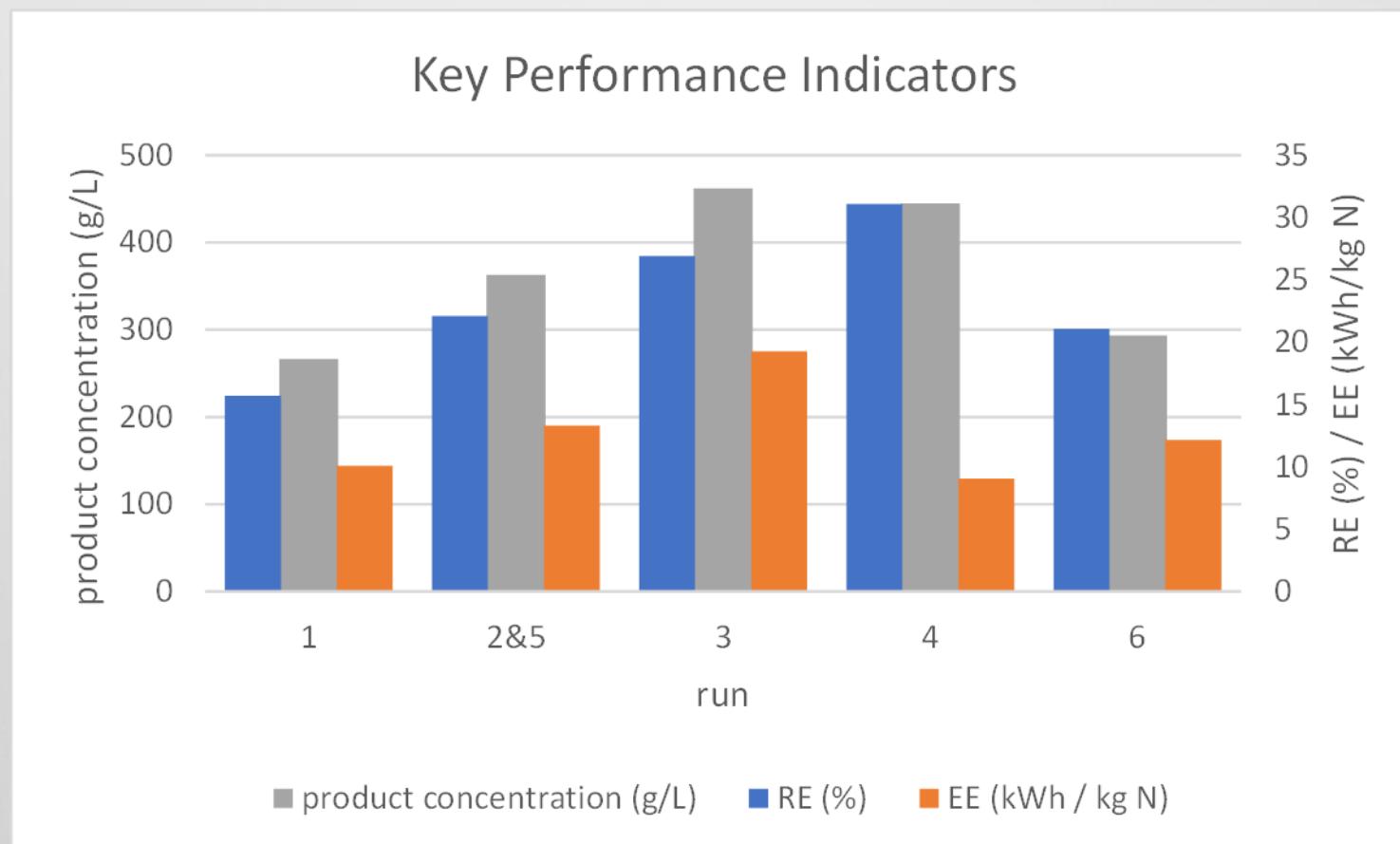


Planned experiments: Pilot Arneco (Arnhem, NL) - urine

| | | <i>Operational Current</i> | | | | | | | | |
|------|----------------------|-------------------------------------|-------------|------------|--------------------|-------------------------|-----------------------------|----------------------|-------------------------|--|
| run# | Variable of interest | Current density (A/m ²) | Current (A) | Load ratio | PSU duty cycle (%) | Overall Feed rate (L/h) | Operational feed rate (L/h) | Feed pump duty cycle | Loading rate (kg N/day) | |
| 1 | | 50 | 2,42 | 1,5 | 1 | 30,4 | 30,4 | 1,00 | 1,31 | |
| 2 | Current density | 100 | 4,84 | 1,5 | 1 | 60,9 | 60,9 | 1,00 | 2,63 | |
| 3 | | 200 | 9,68 | 1,5 | 1 | 121,7 | 121,7 | 1,00 | 5,26 | |
| 4 | | 100 | 4,84 | 1 | 1 | 91,3 | 91,3 | 1,00 | 3,94 | |
| 5 | Load ratio | 100 | 4,84 | 1,5 | 1 | 60,9 | 60,9 | 1,00 | 2,63 | |
| 6 | | 100 | 4,84 | 2,5 | 1 | 36,5 | 36,5 | 1,00 | 1,58 | |
| 7 | Donnan mode | 100 | 4,84 | 1,5 | 0,25 | 15,2 | 150,0 | 0,10 | 0,66 | |
| 8 | | 100 | 4,84 | 1,5 | 0,5 | 30,4 | 150,0 | 0,20 | 1,31 | |

- Each run starts with clean system
- Sample taken after all online-variables are stabilized
- Long term operation if urine-storage allows

Preliminary results: Pilot Arneco (Arnhem, NL) - urine



Future work: Pilot Arneco (Arnhem, NL) - urine

- Follow-up actions:
 - o New stack ready for implementation:
 - o Repeat the characterization tests to observe effect
 - o After second characterization round
 - o Optimise operational method and proceed with CIP implementation
 - o Longevity tests
 - o Parallel development:
 - o partial nitrification of urine and adjustment of ED process to avoid use of H_2SO_4

