

Optimization of production processes with OMEN™

“The problems of the world cannot possibly be solved by skeptics or cynics whose horizons are limited by the obvious realities. We need men who can dream of things that never were.”

John Fitzgerald Kennedy

algorithmica
technologies

OMEN™ in a nutshell

- We can model your production process with our purely mathematical methods
- Using this model, we can optimize the process parameters – dynamic and in real-time
- Parameters are adjusted so that a target is maximized, e.g. output or efficiency (OEE)
- No detailed knowledge of engineering or the chemistry of the process is needed

Practical lessons learned from the use of OMEN™

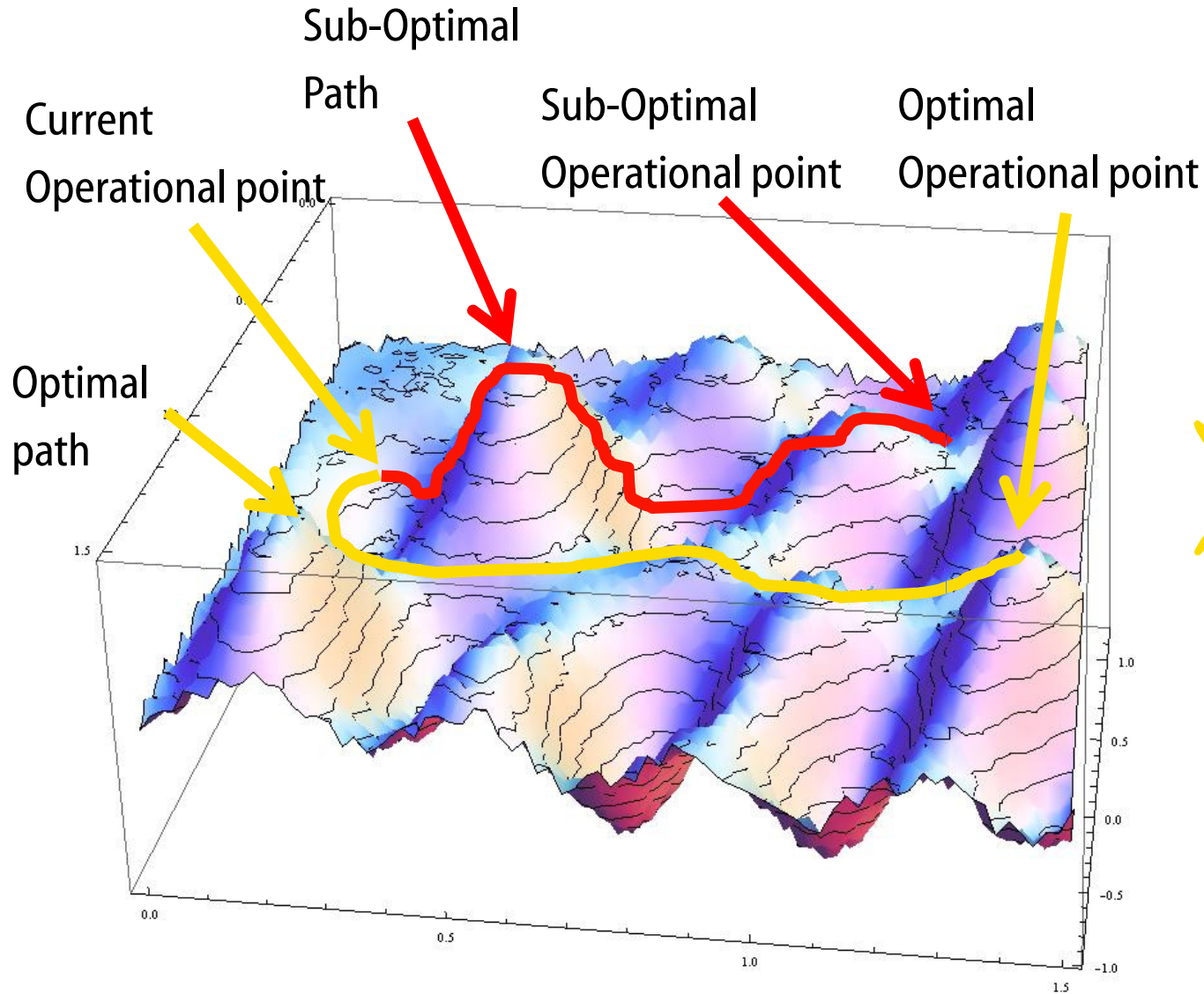
- Yield can be boosted by between 3 – 5%
- Return-On-Investment is usually achieved within 3 – 6 months after installation
- OMEN™ has two principal advantages over a human operator
 - It can oversee the full process including thousands of variables
 - It can implement a 24-7 scientifically based control regime without the variability inherent in several operators working in shifts

Optimal operations can be compared to a well-planned mountain hiking trip

- Longitude and Latitude are the human influencable parameters
- A good hike reaches the goal with a minimum of effort
- The optimal operational strategy is comprised of two planning steps
 - Where is the optimal operational point under consideration of all external factors that we cannot influence?
 - How can this optimal point be reached from the current operational point?

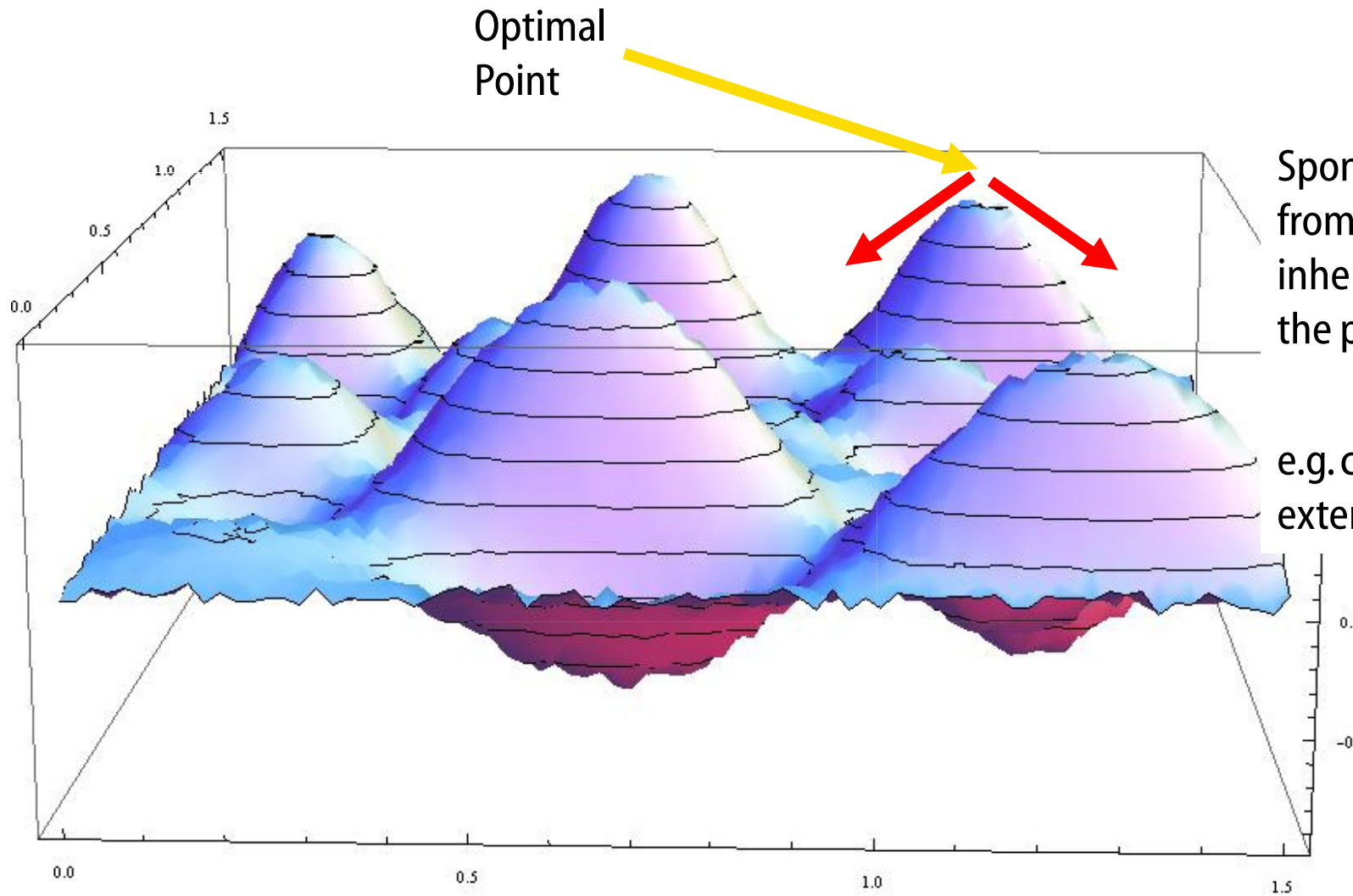


The optimal path guides you through the mountainous landscape of operational points to highest yield



- Instructions like “increase pressure by 10% ...” are generated in real-time
- A 3-5% increase in yield is possible
- There is no comparable technology available

When the optimal point is reached, it must be held

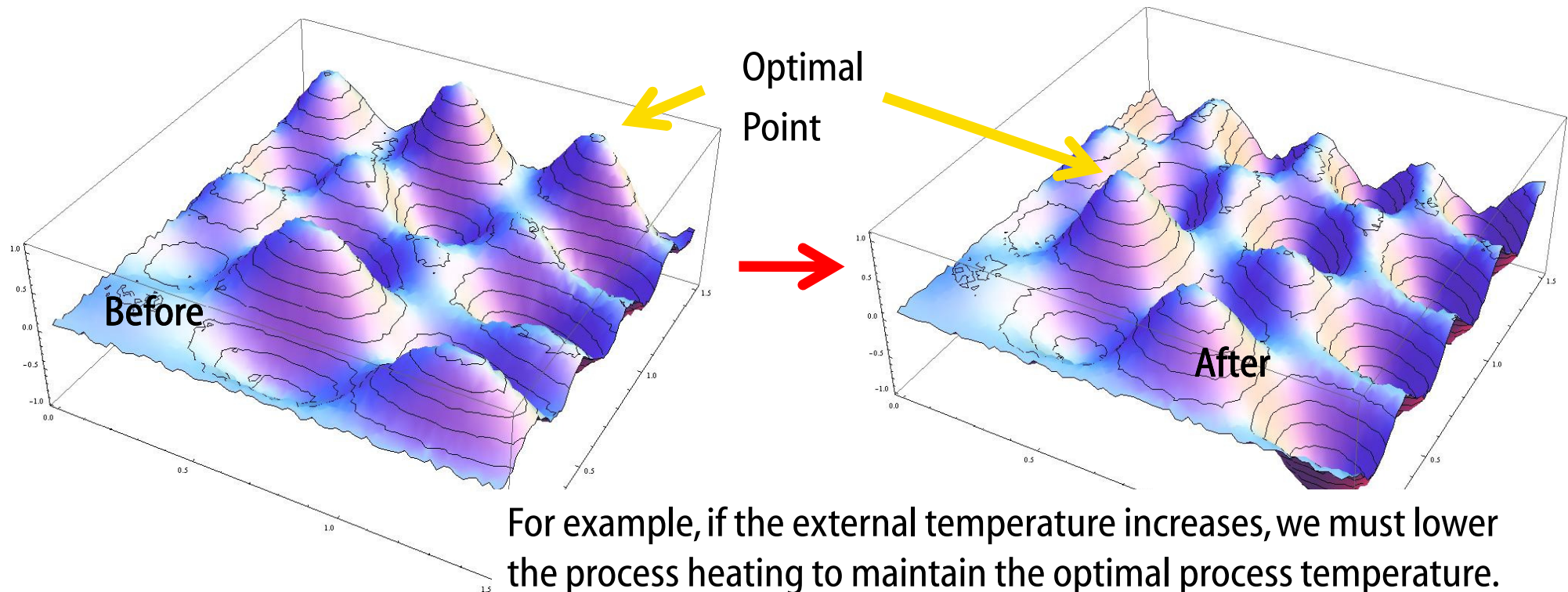


Spontaneous deviations from optimum due to inherent instabilities of the process

e.g. change in the external temperature

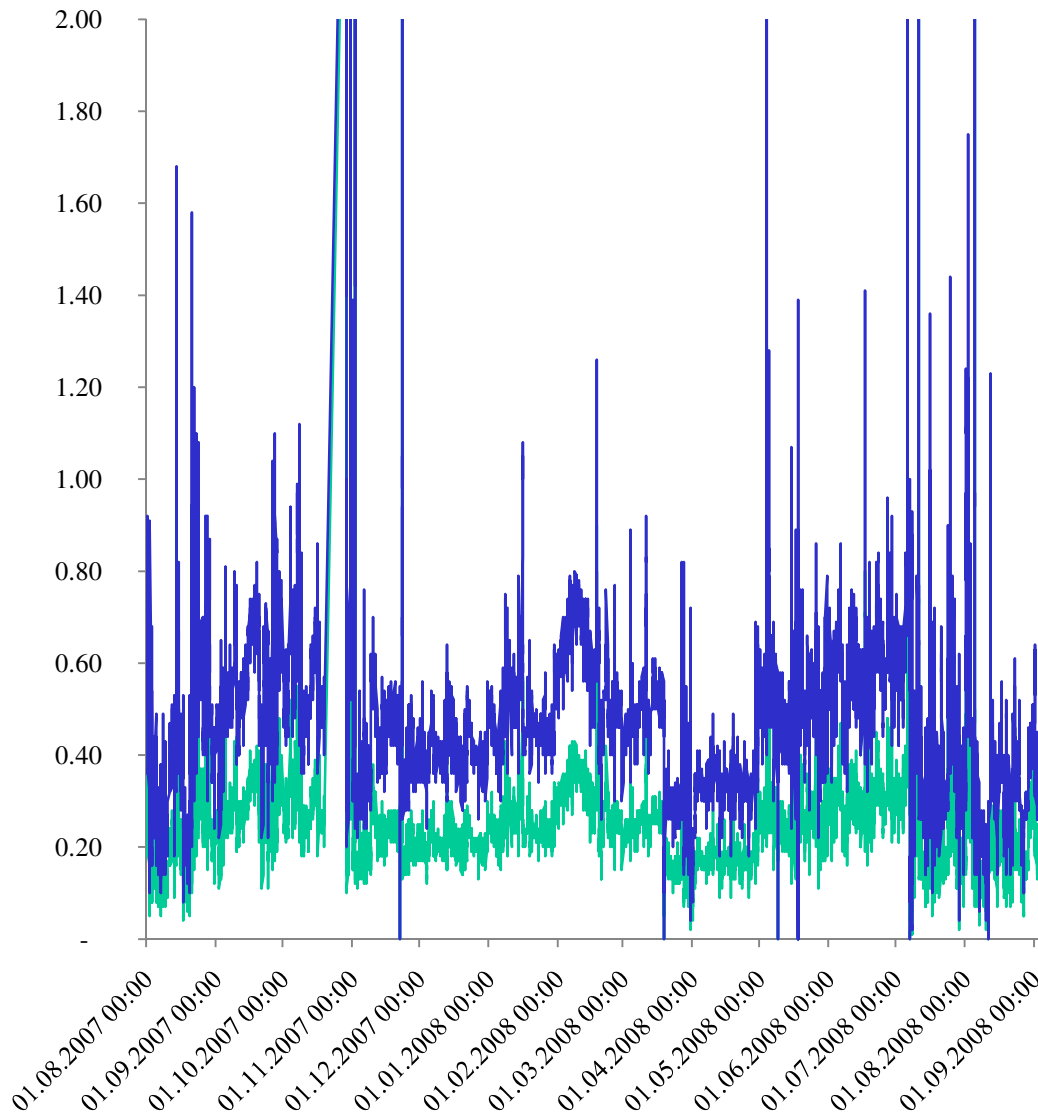
Deviations of uncontrollable Variables change the landscape and move the optimal point

The diagram shows the dependency of the target function (vertical) on two controllable variables (horizontal plane). If an external variable is changed, the whole landscape is altered.



For example, if the external temperature increases, we must lower the process heating to maintain the optimal process temperature. In the space of controllable variables, the optimal point moves.

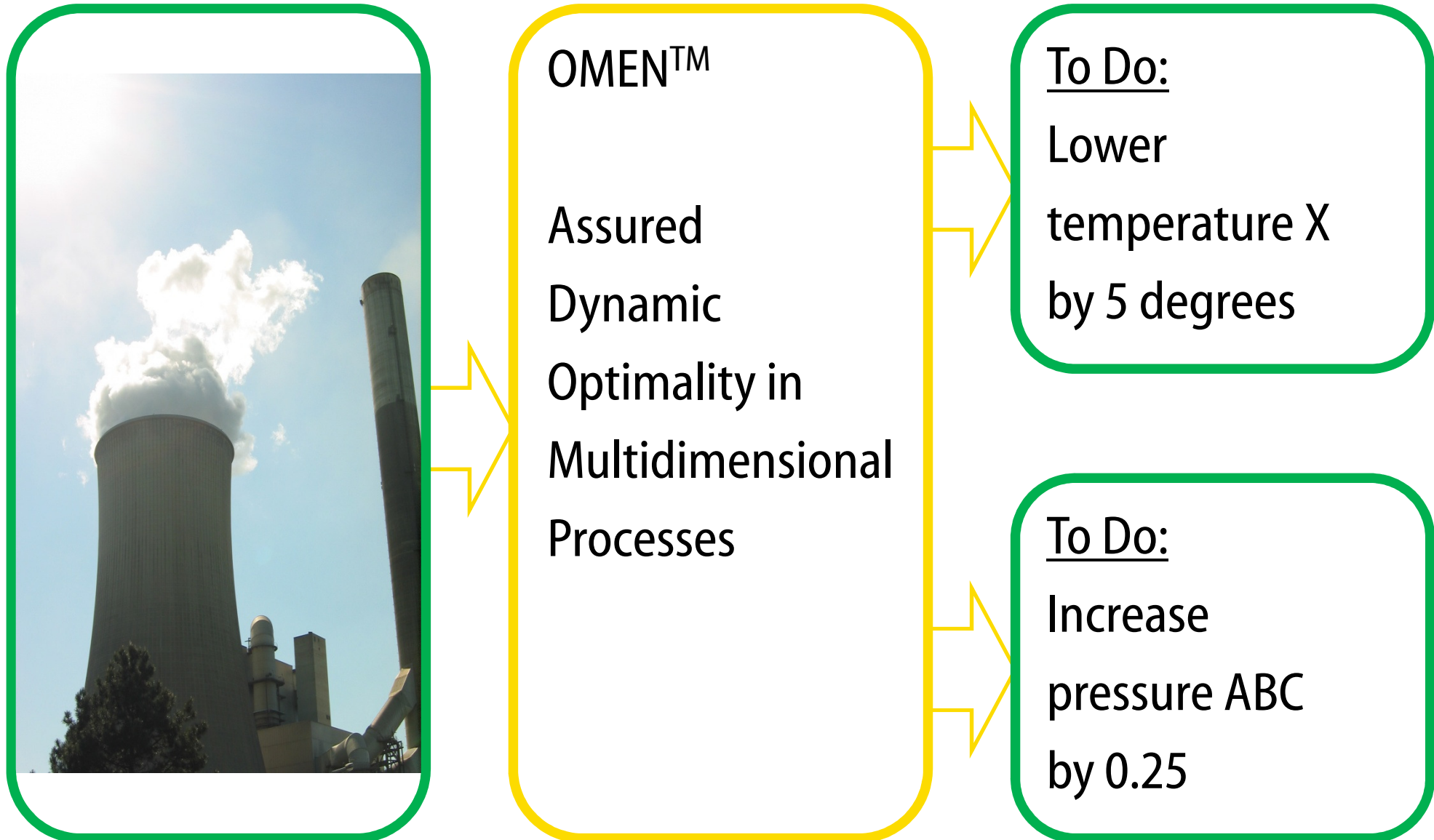
In this case, OMEN improves yield by over 8% almost uniformly over the course of a year



Silicone Production Plant

- OMEN controls over 60 temperatures, pressures and flows to optimize the production
- Over 1600 online measurement points go into the model
- Yield is improved by over 8% directly through the use of OMEN
- This amounts to an increase in revenues by 8.6 million USD per year without any extra costs

OMEN™ is a navigation system that guides you through the multi-dimensional landscape and adjust itself dynamically



A typical optimization project with OMEN™

Step 1:
2-day
workshop



Step 2:
Feasibility
Study



Step 3:
Installation



Step 4:
Software
Maintenance

- Definition of target variables for optimization
- Registration of the process and process data
- Reading out the process data

- Input of process data into OMEN™
- Learning of the model
- Identification of sensitive parameters

- Target identification
- Computation of the optimum operational point
- Implementation into the process control strategy

- Computation of optimal path
- Real-time information flow and optimal point / path discovery

The first steps starts the journey to optimization

Step 1: 2-day workshop

- Definition of target variables for optimization
- Registration of the process and process data
- Reading out the process data

Workshop of two days on-site in your plant

All preparations for OMEN use will be made

Potentials will be estimated

Participants: Management (only partially)
 Process Engineer
 Control System Engineer
 Archive System Engineer

The second step establishes the model

Step 2: Feasibility Study

- Input of process data into OMEN™
- Learning of the model
- Identification of sensitive parameters

Model creation by algorithmica of approx. 3 – 6 weeks

Potential will be quantified exactly

OMEN can now be implemented

The third step implements OMEN in your process



Step 3: Installation

- Target identification
- Computation of the optimum operational point
- Implementation into the process control strategy

OMEN will now be installed on-site

Your team is trained

The computation runs live in real-time and optimizes your process

Please contact us directly for any questions

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