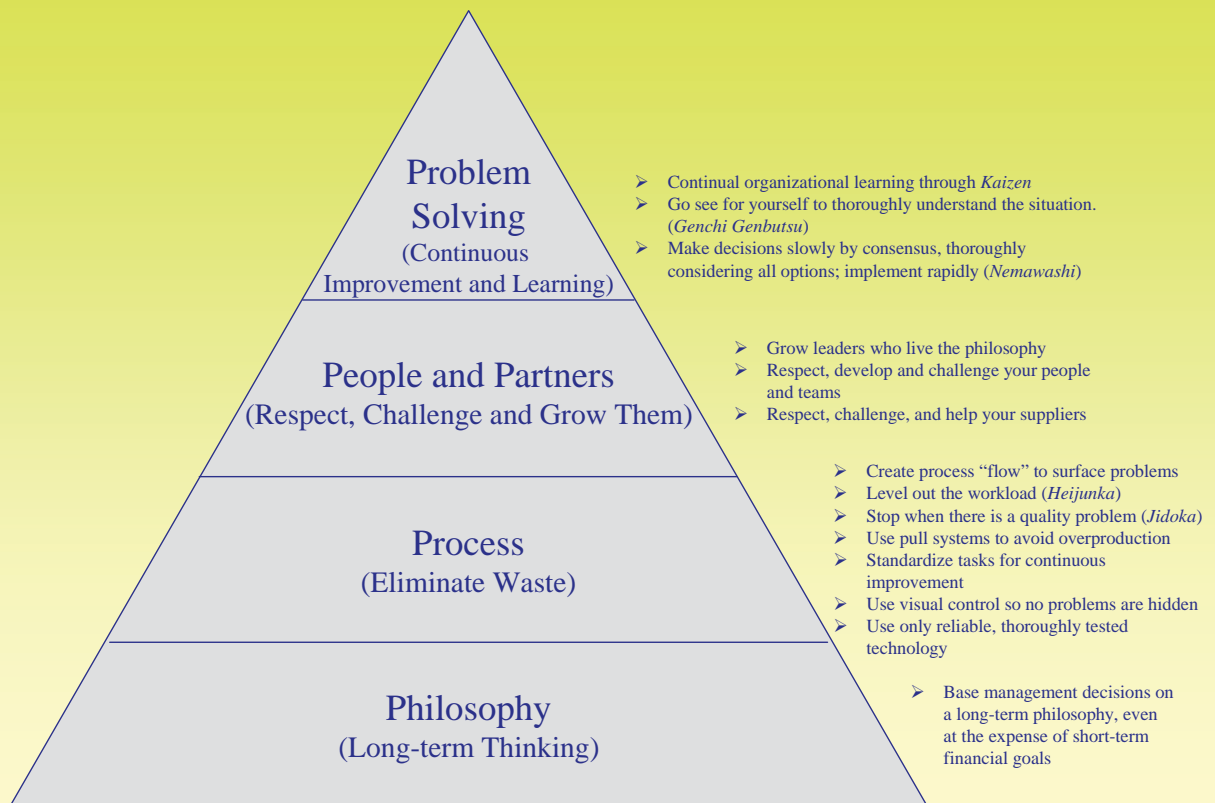


# Lean Six Sigma in Fortum – Success stories and Lessons learned

*Jouni Keronen, Vice President,  
Innovation development and partnering  
Fortum Oyj*



## “4 P” Model of the Toyota Way



# Fortum's Mission

## Mission

Fortum's purpose is to create energy that improves life for present and future generations. We provide sustainable solutions that fulfill the needs for low emissions, resource efficiency and energy supply security, and deliver excellent value to our shareholders.

## 5S



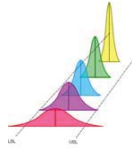
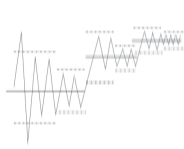
"The need for additional containers, in the distribution business, for storage of supplies was lost after the basic order and method work"

"2889 of 2991 failures and dirt sources found during the basic order and method phase have been corrected"

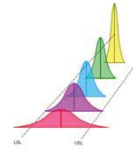
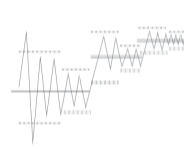




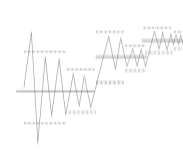
# Process improvement logic, capability improvement and value creation



Measure -> eliminate variation -> improve service level



Measure -> eliminate variation -> improve service level



Measure -> eliminate variation -> improve service level

## Value

- Finding supplier than can deliver biggest value
- Improving cost to quality ratio
- In suppliers side improved understanding what creates value for Fortum

## Value

- Elimination of waste work -> cost savings
- New way of working -> cost savings
- Higher availability, less errors -> cost savings
- Focusing into most important work
- Enables to set "tougher" targets that forces to think new innovative ways of working
- Enables sustainable change

## Value

- Higher quality - > higher price
- Higher quality -> more sales



## Values & key behaviors

Co-create  
Celebrate  
Challenge  
Coach





# Fortum's Problem Solving A3 report (example)

|  |  |   |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
|--|--|---|----------------------|--|-----------------------------------|------------|------------------|--|--|--|--|----------------|------------|-------------|---------------|-------------------------------------|-------------|---------|----------|--|--------------|--------|----------|--|---------|--------|----------|--------------------------|-------------|--------|----------|-------------------------------|--------|--------|----------|--|------|------------|----------|
| Plant: Anoka   | Department: Walmouth Manual 1 line             | Date: 3.2.2010  | Prepared by: Al Mott |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| <b>1. Clarify Problem</b>  |  | <b>4. Find Root Cause</b>   |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
|  |  | <p><b>Comments</b></p> <p>Weldin operation over Takt time<br/>Line is imbalanced<br/>With current balance line should achieve higher output</p>                                     |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| <b>2. Break Down Problem</b>   |  | <b>5. Develop and Decide Actions 6. Conduct Actions</b>   |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| <table border="1"> <tr> <td><b>Method</b></td> <td><b>Machine</b></td> </tr> <tr> <td>Poor product mix<br/>Not enough people<br/>Line imbalanced<br/>Low first pass yield<br/>Can't find material<br/>No sense of urgency</td> <td>Breakdown<br/>Yield<br/>Long setups</td> </tr> <tr> <td><b>Man</b></td> <td><b>Materials</b></td> </tr> <tr> <td>Bathroom breaks<br/>Line short due to vacation<br/>Attitude<br/>Extended breaks</td> <td>Materials not available<br/>Buffing every cover</td> </tr> </table> |  | <b>Method</b>   | <b>Machine</b>       | Poor product mix<br>Not enough people<br>Line imbalanced<br>Low first pass yield<br>Can't find material<br>No sense of urgency | Breakdown<br>Yield<br>Long setups | <b>Man</b> | <b>Materials</b> | Bathroom breaks<br>Line short due to vacation<br>Attitude<br>Extended breaks | Materials not available<br>Buffing every cover | <table border="1"> <tr> <td><b>Actions</b></td> <td><b>Who</b></td> <td><b>When</b></td> <td><b>Status</b></td> </tr> <tr> <td>Balance line according to Takt time</td> <td>Dennis/Dave</td> <td>19 July</td> <td>Complete</td> </tr> <tr> <td>Develop staffing plan to address manpower issues</td> <td>Jim/Margaret</td> <td>1 June</td> <td>Complete</td> </tr> <tr> <td>Establish Standard in process stock levels</td> <td>Mark/Al</td> <td>1 June</td> <td>Complete</td> </tr> <tr> <td>Develop future state map</td> <td>Dennis/Dave</td> <td>1 June</td> <td>Complete</td> </tr> <tr> <td>Incorporate line support role</td> <td>Dennis</td> <td>1 July</td> <td>Complete</td> </tr> <tr> <td>Reduce number of operations by combining</td> <td>Team</td> <td>1 February</td> <td>Complete</td> </tr> </table> |  | <b>Actions</b> | <b>Who</b> | <b>When</b> | <b>Status</b> | Balance line according to Takt time | Dennis/Dave | 19 July | Complete | Develop staffing plan to address manpower issues | Jim/Margaret | 1 June | Complete | Establish Standard in process stock levels | Mark/Al | 1 June | Complete | Develop future state map | Dennis/Dave | 1 June | Complete | Incorporate line support role | Dennis | 1 July | Complete | Reduce number of operations by combining | Team | 1 February | Complete |
| <b>Method</b>  | <b>Machine</b>                                 |   |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| Poor product mix<br>Not enough people<br>Line imbalanced<br>Low first pass yield<br>Can't find material<br>No sense of urgency   | Breakdown<br>Yield<br>Long setups              |   |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| <b>Man</b>   | <b>Materials</b>                               |   |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| Bathroom breaks<br>Line short due to vacation<br>Attitude<br>Extended breaks   | Materials not available<br>Buffing every cover |   |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| <b>Actions</b>   | <b>Who</b>                                     | <b>When</b>   | <b>Status</b>        |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| Balance line according to Takt time  | Dennis/Dave                                    | 19 July   | Complete             |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| Develop staffing plan to address manpower issues   | Jim/Margaret                                   | 1 June  | Complete             |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| Establish Standard in process stock levels   | Mark/Al  | 1 June  | Complete             |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| Develop future state map   | Dennis/Dave                                    | 1 June  | Complete             |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| Incorporate line support role  | Dennis   | 1 July  | Complete             |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| Reduce number of operations by combining   | Team   | 1 February  | Complete             |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| <b>3. Set Target</b>   |  | <b>7. Verify Results</b>  |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
|  |  |   |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
| <p><b>Comments</b></p> <p>The daily output of the line fluctuates greatly<br/>Output is not consistent<br/>The daily productivity goal is not being met<br/>There is no control of the process<br/>The process is not reliable</p>   |  | <p><b>Comments</b></p> <ul style="list-style-type: none"> <li>Floor space reduction of 20 %</li> <li>Cycle time reduction of 75 %</li> <li>Productivity improvement 25 %</li> </ul> |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
|  |  |   |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |
|  |  | <p><b>Future activities</b></p> <p>Implementation of pul system for value stream<br/>Supermarket body blanks and end blanks<br/>Scheduling via signals from warehouse</p>           |                      |  |                                   |            |                  |  |  |  |  |                |            |             |               |                                     |             |         |          |  |              |        |          |  |         |        |          |                          |             |        |          |                               |        |        |          |  |      |            |          |

## Board teams - layout

### Activity list

| Challenge and desired state | Activity | Responsible       | Start | Finish | Status |
|-----------------------------|----------|-------------------|-------|--------|--------|
| SV1                         | SSs      | Kkllk             | PS    | 41     |        |
| PIC 25                      | JJj      | Zzzzc             | TA    | 42     |        |
| SV1                         | LLl      | EPL               | KS    | 41     |        |
| SW                          | OOo      | Lkajsd<br>klkjdaa | TW    | 42     |        |
| MX213                       |          | Sa                | RO    | 44     |        |
| GT 1                        | AAa      | Wqw               | HL    | 51     |        |
| GE-51-b                     | TTt      | EPL               | HW    | 42     |        |

### Input to board team

Improvement proposals

### Purpose of board team

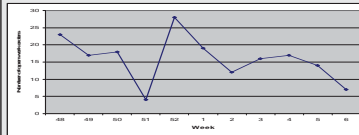
To work with continuous improvements

### Related ongoing work

Project X, etc

### KPIs

Relevant KPIs close to the group



### Members of the group

Status of the members

|                   | Vecka | 29 | 30 | 31 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 |
|-------------------|-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Hasse Larsson     | Shift | 3  | 6  | 7  | 5  | 4  | 2  | 6  | 7  | 1  | 5  | 4  | 3  |    |    |    |    |    |    |
| Roger Ostergren   |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Thomas Westman    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Karl Saarela      |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Dairi Saibi       |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Hamid Kouchaky    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Coach Erik Dahlén |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |



### Value creation

The value creation of the activities are measured in the future [Euro]

### Progress of board team

-Activities completed,

| Activity                           | Aspikts<br>fakt | 2010 |      |      |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
|------------------------------------|-----------------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|--|--|
|                                    |                 | Jan  | Feb  | Mar  | Apr | May | Jun | Jul | Aug | Sep | Okt | Nov | Dec |  |  |  |  |  |  |
| Relevant activities completed time | 85%             |      | 100% | 100% |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| Delivery (contracts)               | 0               | 10   |      |      |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| Absences                           | 85%             |      | 85%  | 85%  |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |

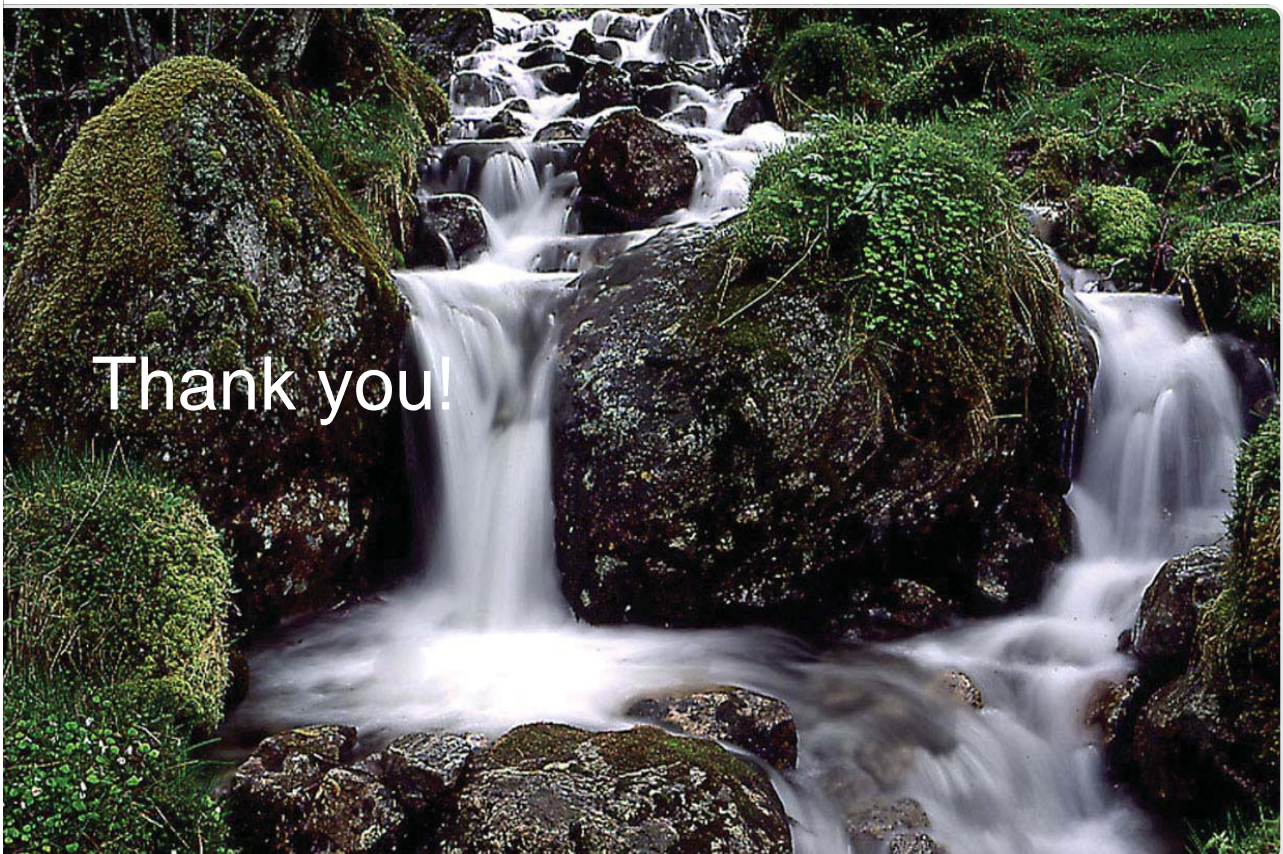
### Agenda

- Attendance
- Follow up activities
- Input
  - KPIs
  - Deviations
  - Improvements
  - Order & method
- Add new activities

# Board teams in Heat Scandinavia



 Fortum



Thank you!