

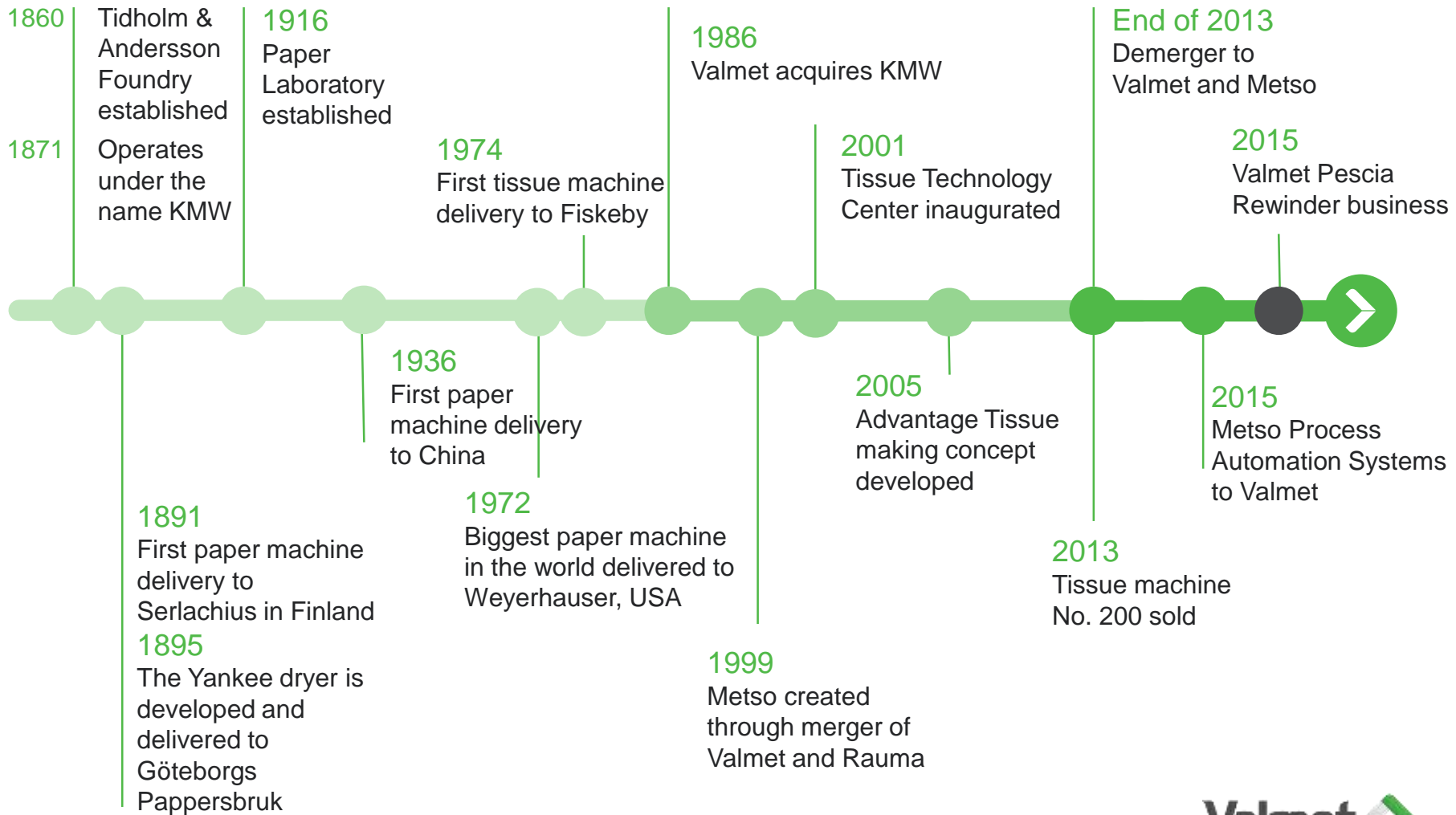
An aerial photograph of the Valmet Karlstad industrial facility. The image shows several large, interconnected industrial buildings with dark roofs, surrounded by parking lots filled with vehicles and trucks. A prominent white water tower is visible on the left side. The facility is situated near a river or lake, with a road and some residential-style buildings nearby. A large green semi-transparent box is overlaid on the top right corner, containing white text.

# Welcome to Valmet Karlstad

Anders Björn, VP, Tissue Mills BU

*November 28, 2017*

# Valmet's history in Karlstad



# PAPER PROVINCE

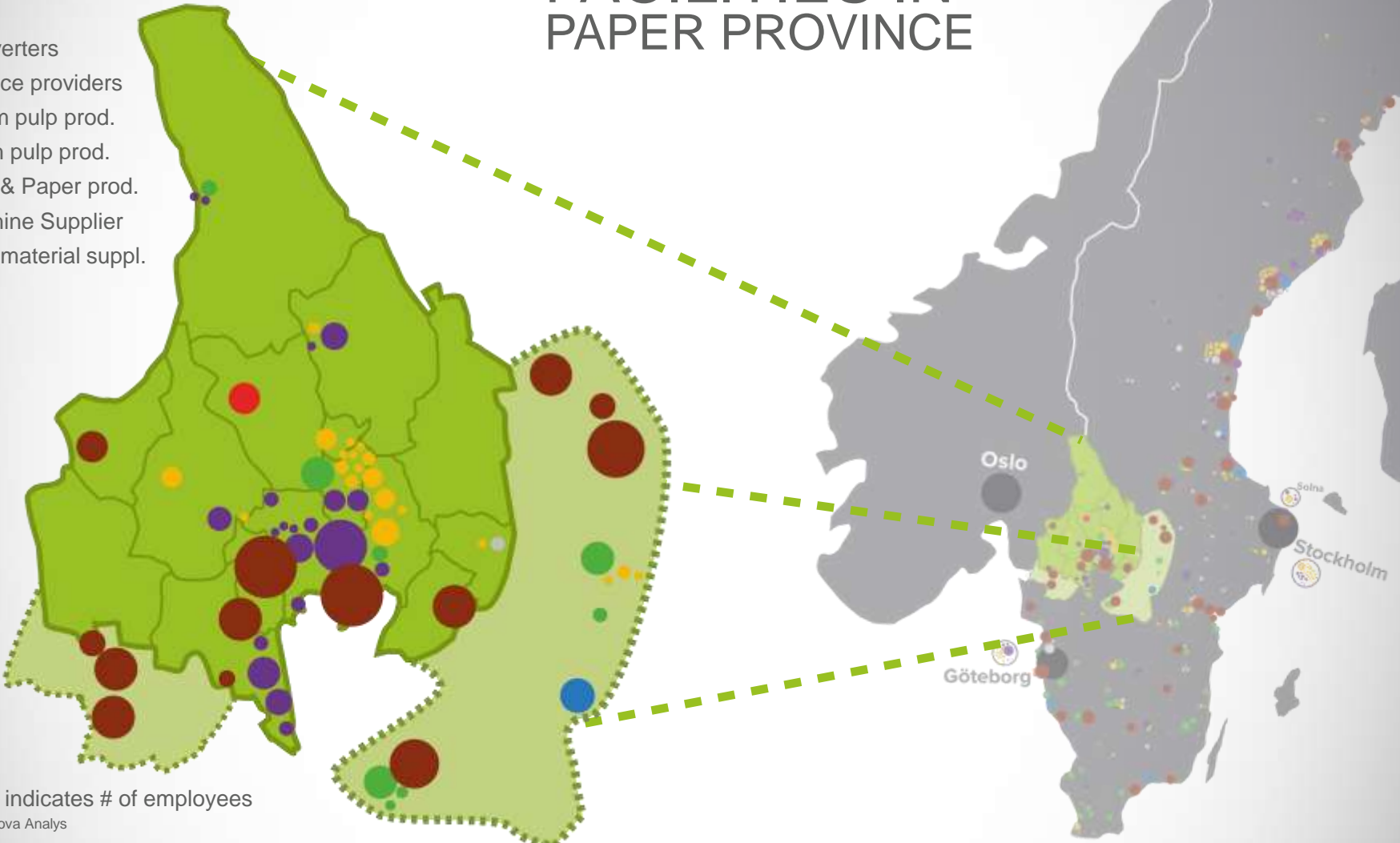
A world-class cluster for companies within the forest-based bioeconomy in mid Sweden.

- Appointed a "World Class Cluster"
- Approx. 7,000 employees in member companies
- 106 member companies
- SEK 14 million turnover in 2015
- Member companies' turnover SEK 23.5 billion in 2015



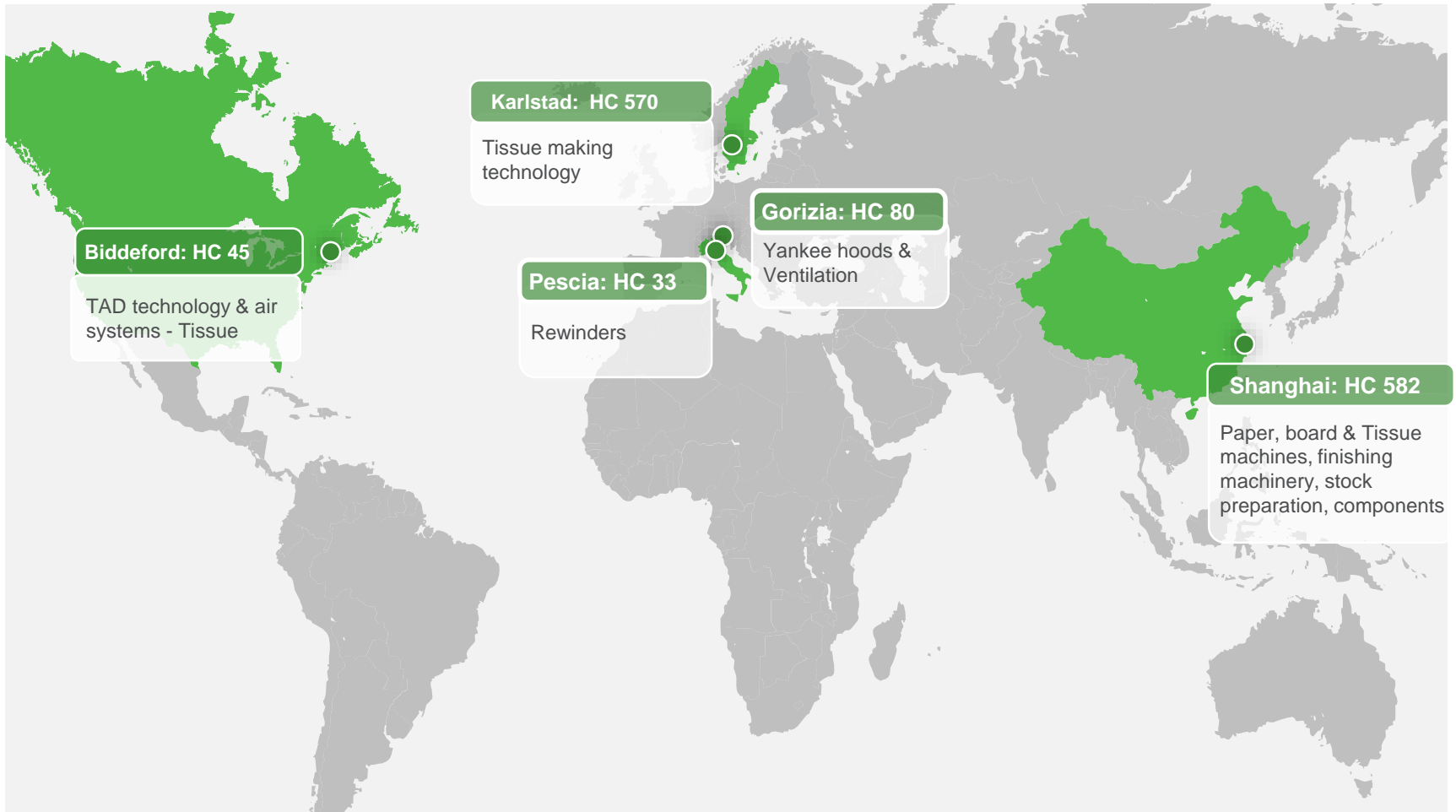
# PRODUCTION FACILITIES IN PAPER PROVINCE

- Converters
- Service providers
- Chem pulp prod.
- Mech pulp prod.
- Pulp & Paper prod.
- Machine Supplier
- Raw material suppl.



Ball size indicates # of employees  
Source: Vinnova Analys

# Paper business line locations



HC = headcount

# Advantage NTT has become a category of its own

Competitive option for production of premium products



# Three tissue machine technologies

covering the whole product range

Advantage™ DCT®  
technology  
Plain tissue



Advantage™ NTT™  
technology  
Plain and textured tissue

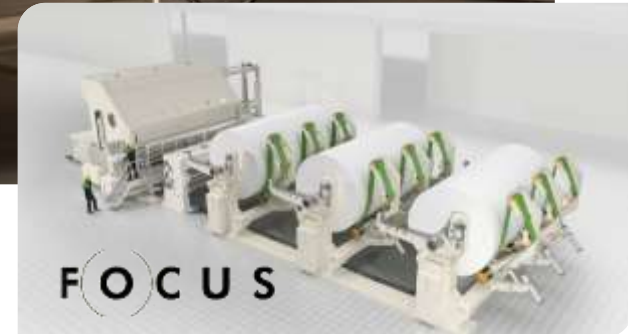


Advantage™ Thru-Air®  
technology  
Structured tissue



# Valmet Pescia, a new member of our family

Rewinders for Tissue and Nonwovens production





# Increasing demand for large scope of supply

Project scope 40 new installations 2013-2017



# New orders

2015-2017



## Advantage DCT

### New orders

- 8 x Lee & Man, China
- FAPSA TM7, Mexico
- Hayat Kimya TM7, Russia
- ICT B2, Spain
- Fine Hygienic Holding, Abu Dhabi
- Crown Paper, Abu Dhabi
- Crecia, Japan
- Confidential, NA
- Confidential, EMEA



## Advantage NTT

### New orders

- 2 x Sofidel, Circleville, USA
- Sofidel, Delitissue, Poland
- Sofidel, Ibertissue, Spain
- Resolute, USA
- Renova, Portugal
- Confidential
- Confidential



## Advantage ThruAir

### New orders

- First Quality Tissue, TM4, USA
- Irving Tissue, North America

# New installations

2015-2017 Total added capacity to the market 1.2 Million annual tons



## Advantage DCT

### Start-ups

- Aktül Kagit TM2, Turkey
- Hayat Kimya TM5, Turkey
- Hayat Kimya TM6, Egypt
- Hengan TM 19 & 20, China
- Lee & Man TM 4, 5,6,7,8, China
- PT Suparma, Indonesia
- Faderco, Algeria
- Grupo Corporativo, Mexico
- Tezol, Turkey
- ICT, Poland
- Confidential, EMEA



## Advantage NTT

### Start-ups

- von Drehle, USA
- Renova, Portugal
- Resolute, USA
- FPC, Chile
- ADNPM, Abu Dhabi
- Confidential



## Advantage ThruAir

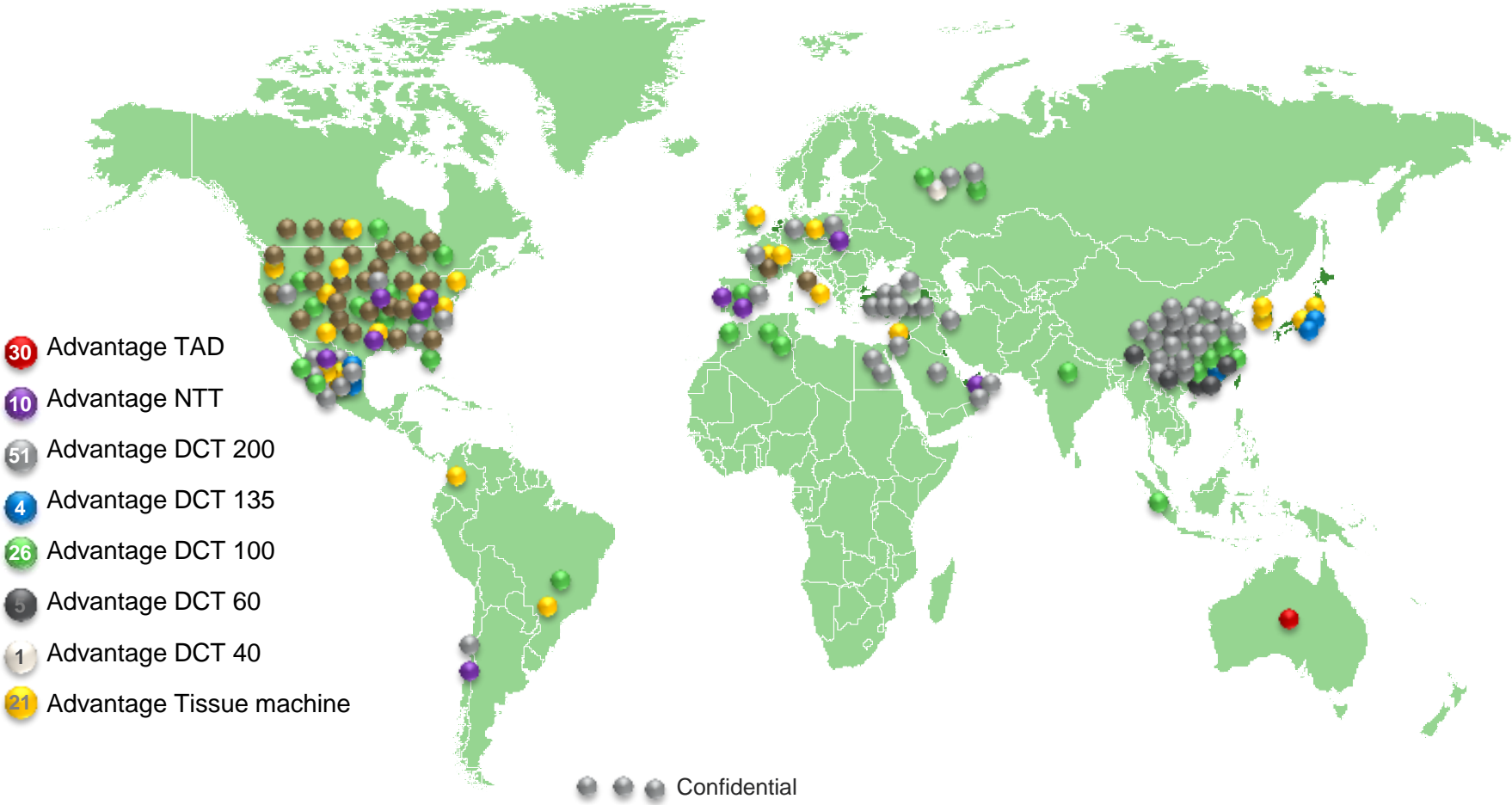
### Start-ups

- First Quality Tissue TM3, USA

# Tissue machine orders

2000-2017 (148)

(Totally 248)



# Large demanding international projects

Experienced Project teams and a wide competence network



# Way to operate

Partnership based on mutual trust and common targets

Repeat orders  
New machines

No. of  
Customers

No. of orders

7

7 or more

9

3 - 6

9

2

# Way to operate

Continuous improvements and  
process oriented operations

## Valmet Project Execution Model

- Sales & delivery process model
- Life cycle process model
- Internal project process model

# Valmet Project Execution Model

From function-oriented to process-oriented sales and delivery process




G-2	Decision to quote to customer
G-1	Decision to negotiate and offer agreement to customer
G 0	Decision to start internal project establishment work
G 1	Project start: Decision to start basic engineering
G 2	Decision to start detailed engineering, purchasing and manufacturing
G 3	Decision to deliver foundation for installation purchase, by ourselves or by customer
G 4	Decision to start shipping
G 5	Decision to prepare for installation
G 6	Decision to prepare for check out
G 7	Decision to finalize site activities and reduce project organization
G 8	Project closing: Decision to close the project



# Valmet Performance center

Data-driven reliability and performance services





# Tissue market, challenges and opportunities

Investor site visit to Karlstad

*November 28, 2017*

Jan Erikson

Vice President, Sales

Tissue Mills Business Unit

# Cellulose based paper products

Three main categories

Tissue & Towel  
Caring



Containing  
Protecting



Communicating



# Tissue

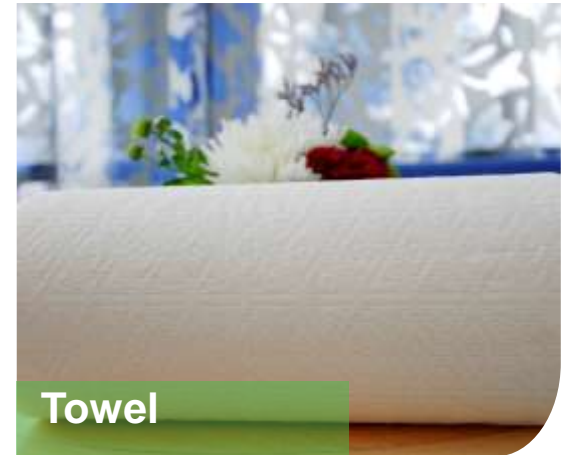
## Products and segments



- Standard
- Premium
- Ultra premium



- Standard
- Premium
- Ultra premium



- Standard
- Premium
- Ultra premium

# Tissue paper

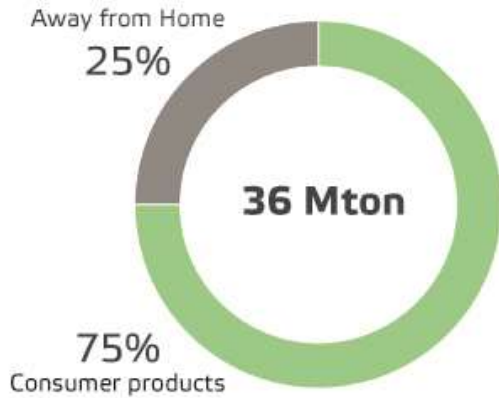
## #1 non-food fast moving consumer good

- Hygiene is an important factor for development
- Faces few substitution threats
- Not very sensitive to cyclical changes in economy
- No mandatory product specifications
- Product development, image/brand and confidentiality – vital competitive tools
- Consumption drivers
  - Economic growth and growing middle class
  - Population growth and urbanization
  - Raising quality demand

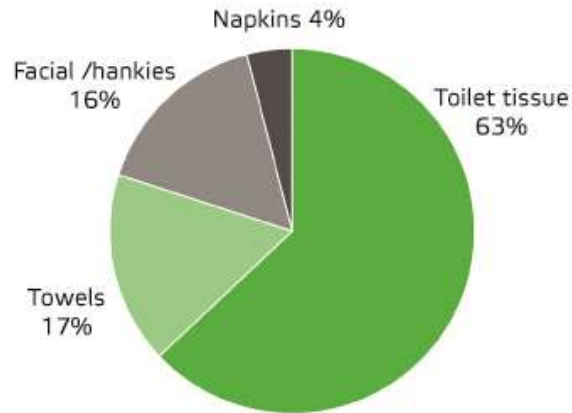


# Tissue World Market

## Market by segment



## Consumer products



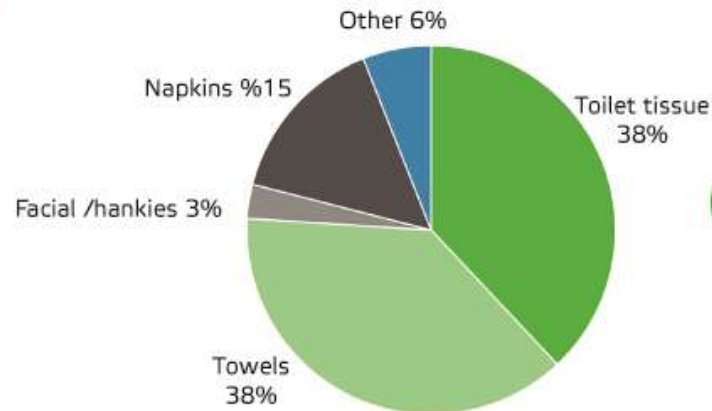
## Branded products



## Private label



## Away from Home



- Restaurants
- Hotels
- Public
- Business

# Drivers for tissue growth

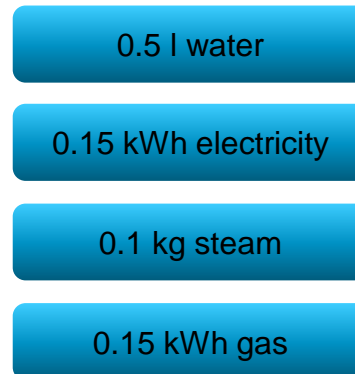
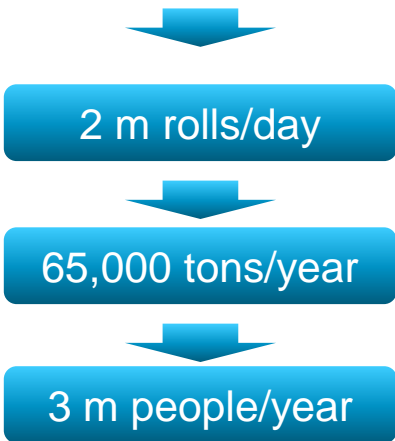
- Expected future economic growth
  - Global GDP growth approx. 3%
- Population growth and other demographic changes
  - Global growth 1%
  - Urbanization
- Product penetration levels
  - Distribution and sales channels
  - Towel is growing
  - New products
- Developments in tissue quality and product specifications
  - Higher quality when basic needs are met
  - Step change at consumption 10 kg/person/year
- Substitution effects and AFH dispenser developments
  - Hot air dryers
  - Textile



# How tissue is made



Advantage DCT 200 – width 5.6 meter





# One tissue machine for every need

Advantage™ DCT®  
technology



High quality tissue with high efficiency and reliability



Advantage™ NTT®  
technology



Premium quality textured tissue with high bulk and softness



Advantage™ Thru-Air®  
technology



Superior quality structured tissue with excellent absorbency and softness



# Consumer trends and needs

**Consumer trends**

**Products** Bath, towel brands & private label

**Quality** multi-ply, softness, mixed conventional/premium

**Trends** growth of towel & bath Hybrid technology growth

**Impact** raising quality demands, environmental concerns

**Consumer trends**

**Products** Bath, facial, towel mainly brands

**Quality** TAD 30%, quality focused private label

**Trends** high quality, TAD & Hybrid technologies

**Impact** Economic growth, private labels are challenging brands

**Consumer trends**

**Products** Bath, facial mainly brands

**Quality** standard, hard rolls

**Trends** higher quality, towel

**Impact** urbanization, improved living standards

**Consumer trends**

**Products** Bath, towel brands & private label

**Quality** from 1 ply to 2 ply,

**Trends** Towards higher quality

**Impact** high growth, low price focus

**Consumer trends**

**Products** Bath, facial, mainly brands

**Quality** high quality facial

**Trends** high quality MENA

**Impact** low purchasing power, low cost products, tourists trendsetters

**Consumer trends**

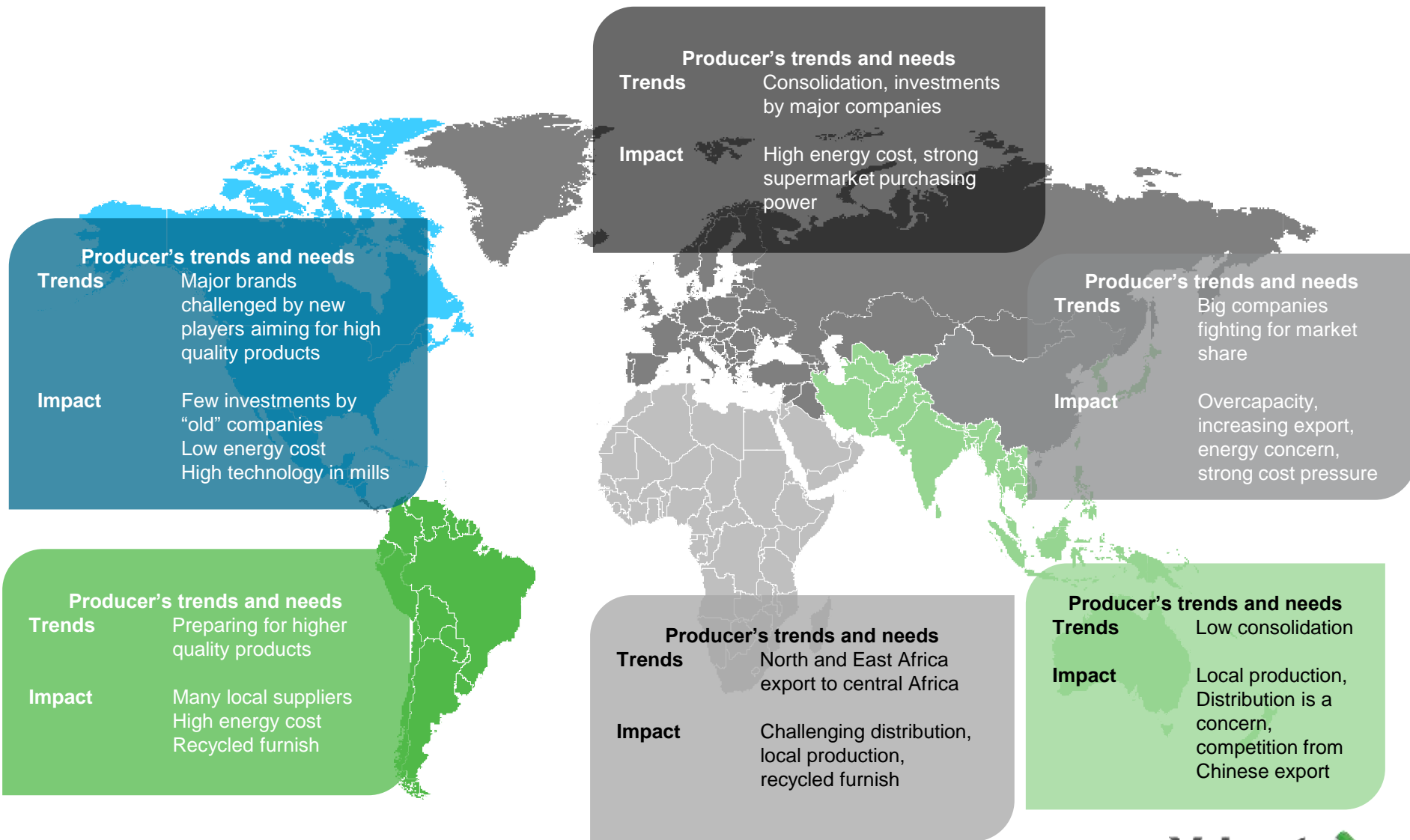
**Products** Bath, facial, towel mainly brands

**Quality** low / high

**Trends** towel growth

**Impact** urbanization, culture, variation of demands

# Producers' trends and needs



# “Amazon Linking with US Tissue Paper Suppliers to Speed Supply Chain”

Hundreds of brands and pack sizes

Health & Personal Care > ["toilet paper"](#)

Related Searches: [laundry detergent](#), [paper towels](#), [toothpaste](#)

Showing 1 - 60 of 6,107 Results Detail Image Sort by Relevance

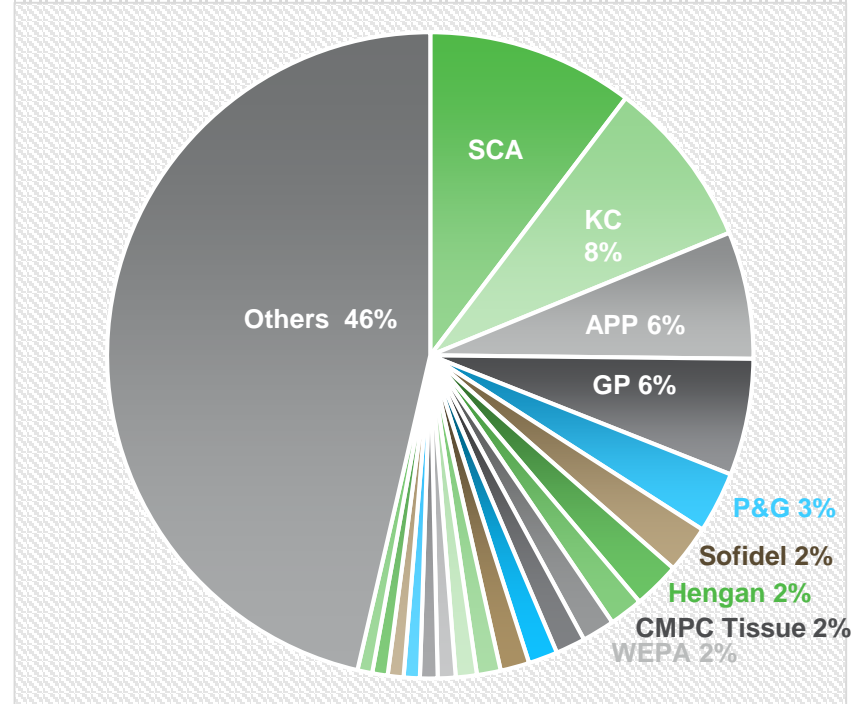
<p>Quilted Northern Ultra Plush Bath Tissue, 48 Double Rolls (Packaging May Vary) <b>\$23.94</b> (\$0.50/count)</p>	<p>Cottonelle Ultra Comfort Care Toilet Paper, Big Roll (12 Rolls) <b>\$10.00</b> (\$0.83/count)</p>	<p>Angel Soft, Double Rolls, [4 Rolls*12 Pack] = 48 Total Count <b>\$21.99</b> (\$0.46/count)</p>	<p>Charmin Ultra Soft Bathroom Tissue 9 Family Rolls <b>\$11.59</b> (\$0.97/in)</p>

## Major global tissue producers 2016

Pos	Major tissue producer	Eff. Capacity Kton/a	% of Capacity
1	SCA	4582	10
2	Kimberly - Clark	3751	8
3	APP	2818	6
4	Georgia-Pacific	2585	6
5	Procter & Gamble	1355	3
6	Sofidel	1058	2
7	Hengan	1038	2
8	CMPC Tissue	844	2
9	WEPA	724	2
10	Kruger Tissue	657	1
11	Cascades	647	1
12	Metsä Tissue	641	1
13	ICT	527	1
14	C&S Paper Group	466	1
15	Clearwater Paper	395	1
16	Daio Paper	390	1
17	Corelex	357	1
18	Hayat Kimya Group	350	1
19	YFY	342	1
20	First Quality Tissue	327	1
	Others	20546	46
	<b>Total</b>	<b>44300</b>	

## Global tissue consumption 2016

Tissue consumption 36 MT/a  
 Installed capacity 44.3 MT  
 Tissue Machines >3,400  
 of which ~1,700 in China  
 Typical capacity 15,000 - 60,000 T/a  
 Largest capacity 100,000 T/a





# Tissue Technology Center

Investor site visit to Karlstad

*November 28, 2017*

Karl-Johan Tolfsson

Manager, Tissue Technology Center



# Leading technologies with high flexibility

developed by customer demand



## Advantage NTT technology

- Plain and textured tissue production
- Premium Quality
- Low energy and fiber consumption
- High capacity



## Advantage ViscoNip press

- Linear load flexibility
- Significantly reduced energy consumption
- Improved product quality – bulk and softness
- Improved runnability



## Advantage ReTurn – energy recovery

- Recover > 50% of headbox jet power
- Return it as electricity to the tissue process
- Significant cost savings



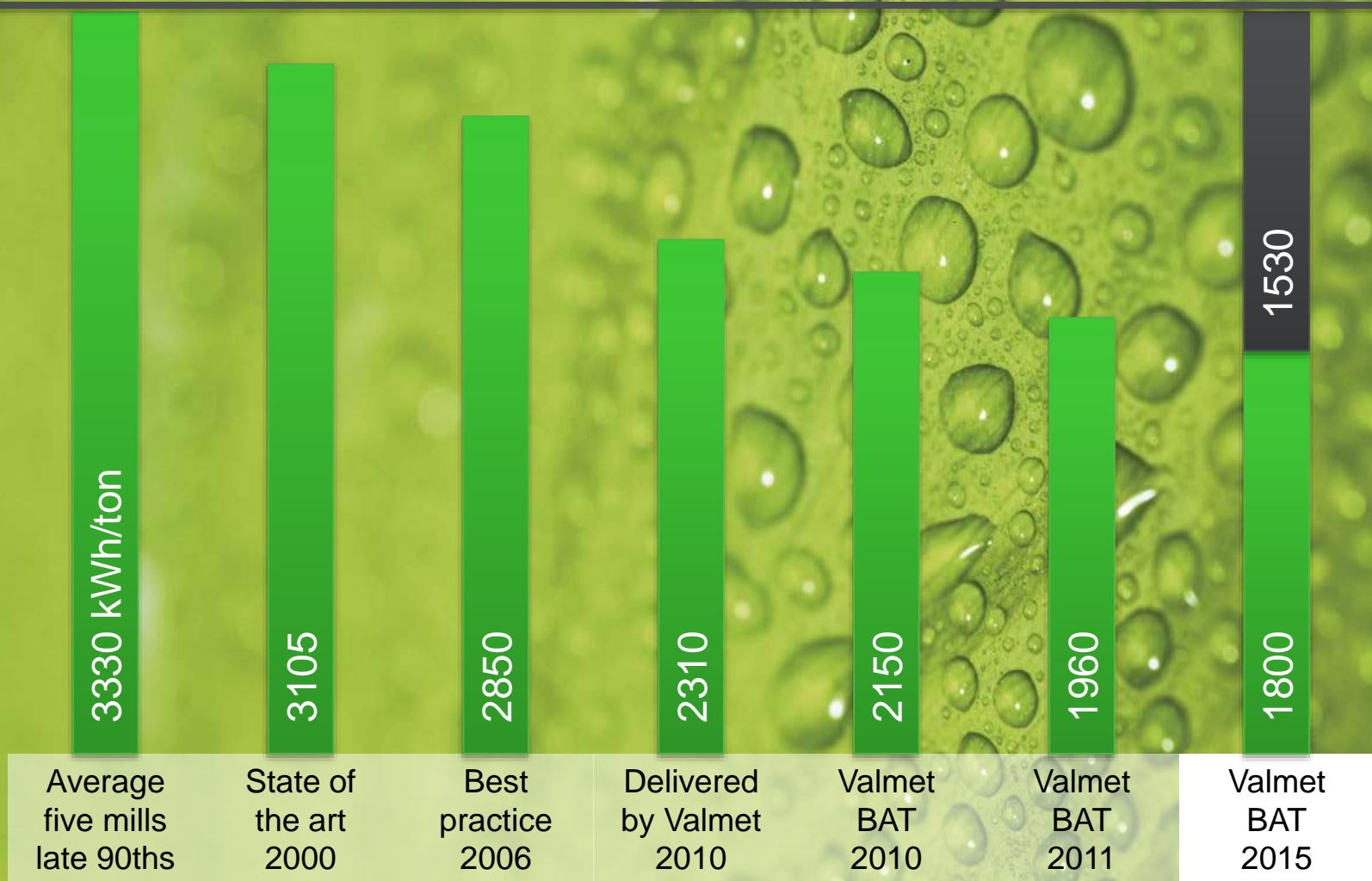
## Industrial Internet Services

- Remote Services
  - Monitor, control and maintain high efficiency
- Simulator training
  - Increase and maintain high operator competence



# Reaching energy targets

Total Specific Energy Consumption  
kWh/ton



# Pilot machine / mill



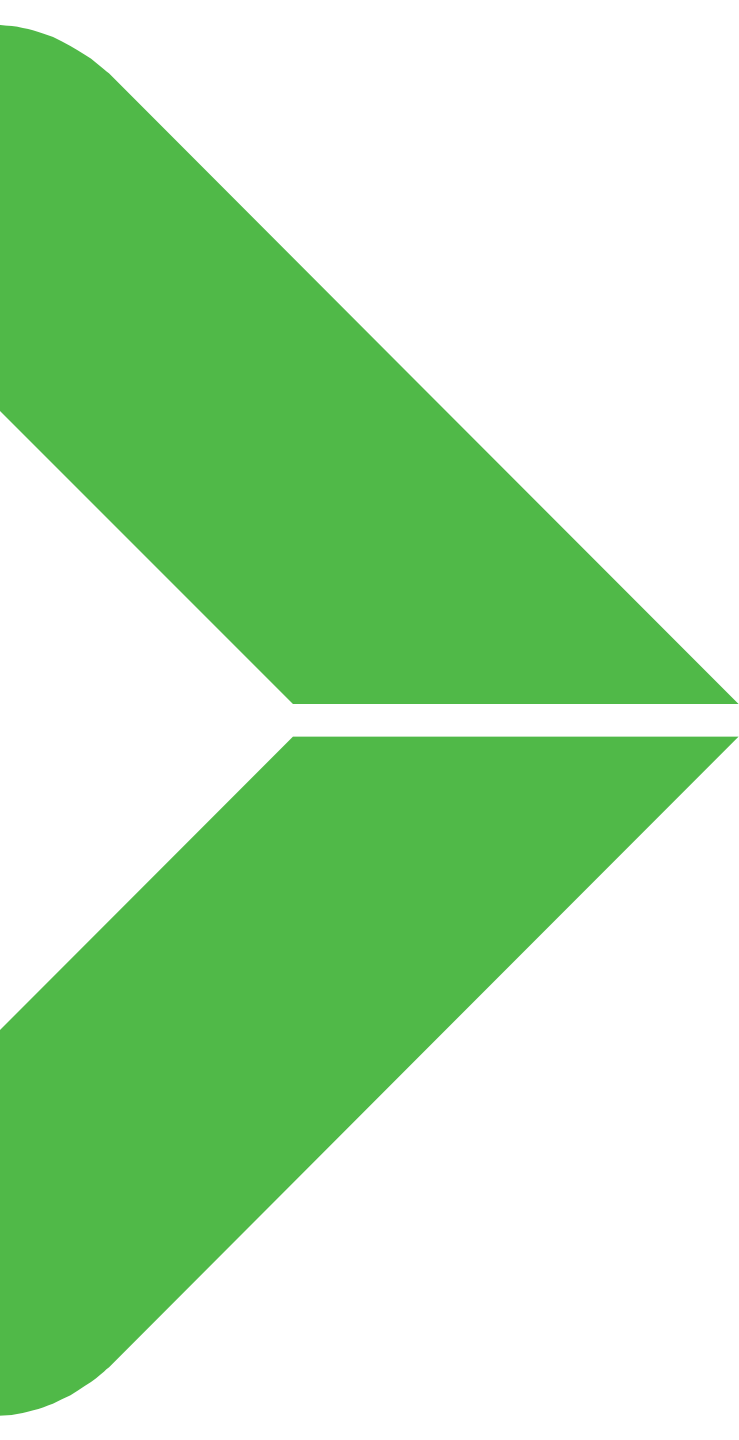


**1/3**

Internal trials

**2/3**

External customers



# Industrial Internet – Dialogue with data

Investor site visit to Karlstad

*November 28, 2017*

Kent Nika, Sales Manager

# Content

1

Industrial Internet – definition

2

Dialogue with data – how to use all data?

3

Case studies

4

Summary



QCS

ERP

MES

MCS

PDM

DCS

CRM

# The concept of Industrial Internet

- By industrial internet we mean the integration of physical machinery with networked sensors and software.
- This enables gathering and analyzing data from machines and processes, and utilizing it to adjust operations and plan predictive maintenance to positively affect the value chain.



The topic has many names:

- Industrial Internet
- Internet of Things
- Industry 4.0
- Internet of Services
- Big Data

# Today, customers are extensively utilizing our Industrial Internet capabilities





# Valmet Industrial Internet



Dialogue  
with data

## Building blocks

Ecosystem

Applications  
and services

Automation  
and IT platform

Process  
technology

## Offering

### Reliability services

- Component reliability monitoring and diagnostics
- Sub-process reliability improvement
- Mill and plant reliability optimization

### Performance services

- Process performance optimization
- Mill and plant performance optimization
- Fleet performance optimization

### Valmet Performance Center

- On-demand expert support
- Remote monitoring and optimization
- Data discovery and analysis

# Valmet Performance Centers

Your channel to all our data-driven reliability and performance services



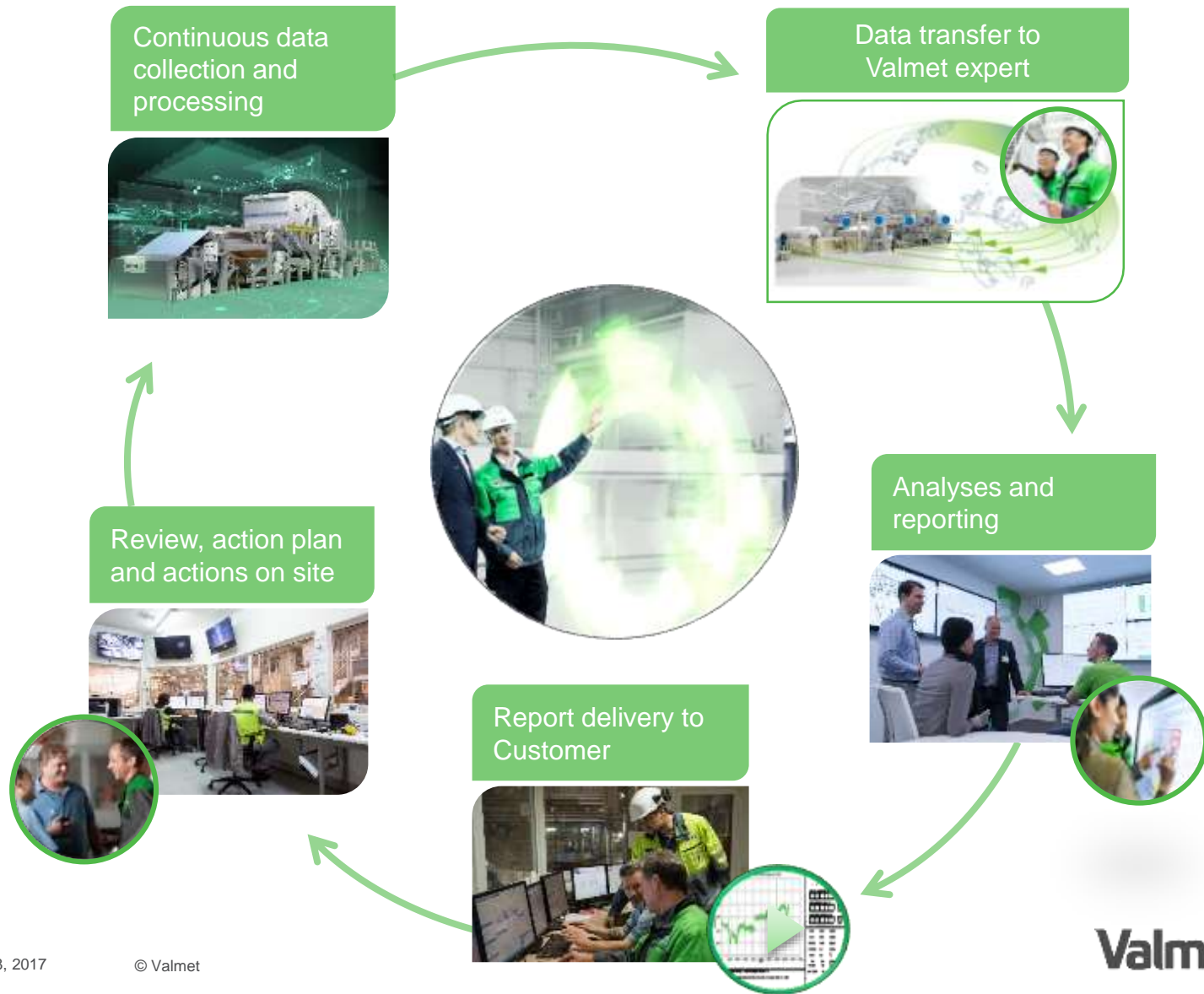
# Dialogue with Data



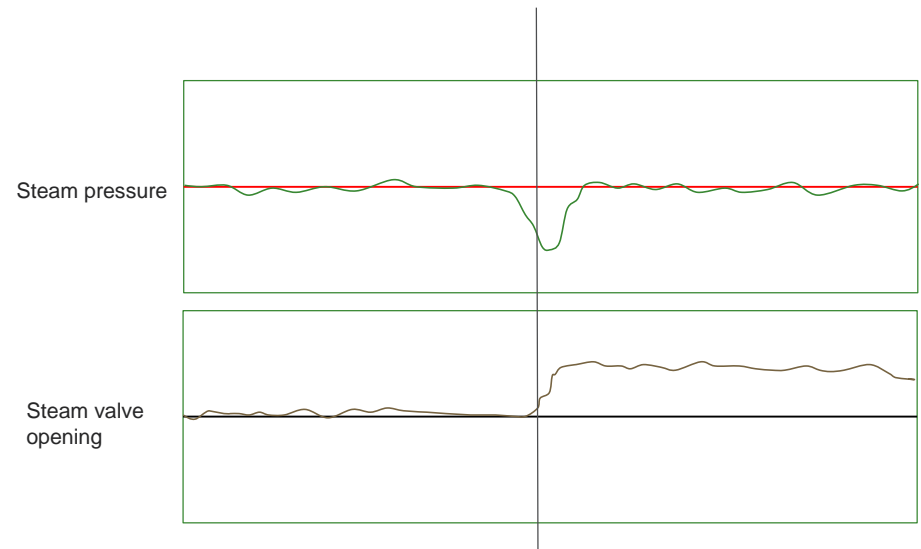
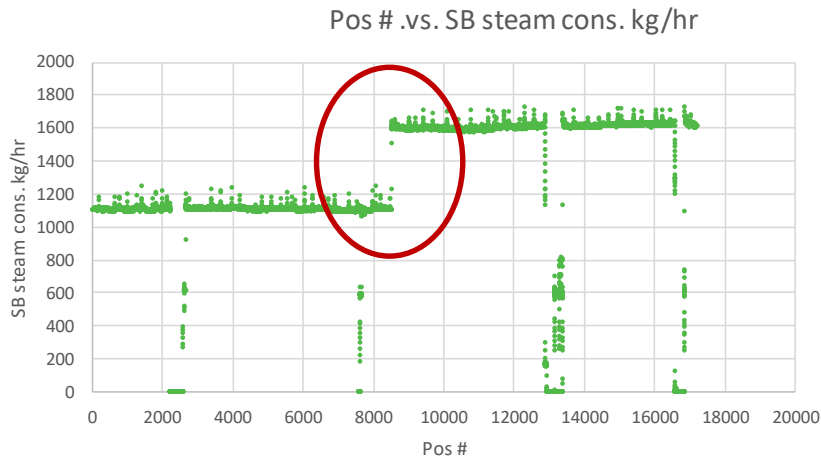
A woman with blonde hair, wearing a green high-visibility safety jacket over a dark shirt, is pointing with her right hand at a large computer monitor. The monitor displays a complex technical diagram with various colored boxes, lines, and text, likely a process flow or control system. She is sitting at a desk with a keyboard and a mouse. In the background, there are other computer monitors and a control room environment. A semi-transparent green box is overlaid on the right side of the image, containing the text "Case 1 Performance services".

Case 1  
Performance  
services

# Performance services - The process



# Root cause analysis



## Conclusion:

- Transmitter malfunction

## Recommendation to customer:

- Replace transmitter

## Saving at mill:

- 500 kg/hr
- 9 EUR/hr
- 75,000 EUR/year

- System analysis: deviation in the steam pressure value of a machine, system unable to correct
- Valmet engineers analyze and give recommendations to manually check the transmitter at the machine.
- Mill operators check and notice that the transmitter is broken.
- Transmitter is changed. Steam flow decreases to normal flow again.

A large industrial machine, possibly a lathe or mill, is shown in a factory setting. The machine is dark grey and has a large, circular, perforated metal component on the left side. A green text box is overlaid on the right side of the machine. The background shows a factory floor with various equipment and structures.

Case 2  
Troubleshooting with  
remote support

# Tissue mill in South America

A real case example of troubleshooting with remote support

- Tissue mill in South America with shoe press technology
- Target: to change linear load profile on the shoe press
- Experienced problem: changing profile does not give the expected response



Comparison traditional problem solving vs. remote support



# Traditional vs Remote support

## Traditional analysis

### Analysis and conclusions

- Leakage in hydraulic cylinders assumed, largely based on earlier experiences
- Decision to replace cylinders with advisory services

### Actions and results

- Order new cylinders: 10,000 EUR
- Order external resources on site OEM: 10,000 EUR
- Unplanned shutdown: 24 hours
- Lost production: 150 tons



## Analysis using data

### Analysis and conclusions

- Analyze data from hydraulic system – 2 hours
- Conclusion: Incorrect valve mounted in the press. Change valve

### Actions and results

- New Valve: 15 EUR
- Order external resources on site OEM: 0 EUR
- Unplanned shutdown: 10 minutes
- Lost production: 1 ton



### Savings:

- Equipment: 10,000 EUR
- Services: 10,000 EUR
  
- Downtime: 23 hours 50 minutes
- Production: 149 tons of tissue

# Dialogue with Data





### Summary

- Industrial Internet is proven and used in many Valmet deliveries
- Tools with models are available for Valmet tissue mills
- Dialogue with data works with reliable and safe connections
- Potential is very high in terms of performance, savings and quality

The question is not how much data we can collect.  
The question is how to utilize the data!

# Important notice

It should be noted that certain statements herein which are not historical facts, including, without limitation, those regarding expectations for general economic development and the market situation, expectations for growth, profitability and investment willingness, expectations for company development, growth and profitability and the realization of synergy benefits and cost savings, and statements preceded by “anticipates”, “believes”, “estimates”, “expects”, “foresees” or similar expressions, are forward-looking statements. Since these statements are based on current decisions and plans, estimates and projections, they involve risks and uncertainties which may cause the actual results to materially differ from the results currently expressed. Such factors include, but are not limited to:

- 1) general economic conditions, including fluctuations in exchange rates and interest levels which influence the operating environment and profitability of customers of the company or economic growth in the company’s principal geographic markets.
- 2) industry conditions, intensity of competition situation, especially potential introduction of significant technological solutions developed by competitors, financial condition of the customers and the competitors of the company,
- 3) the company’s own operating factors, such as the success of production, product development and project management and the efficiencies therein including continuous development and improvement
- 4) the success of pending and future acquisitions and restructuring.

