



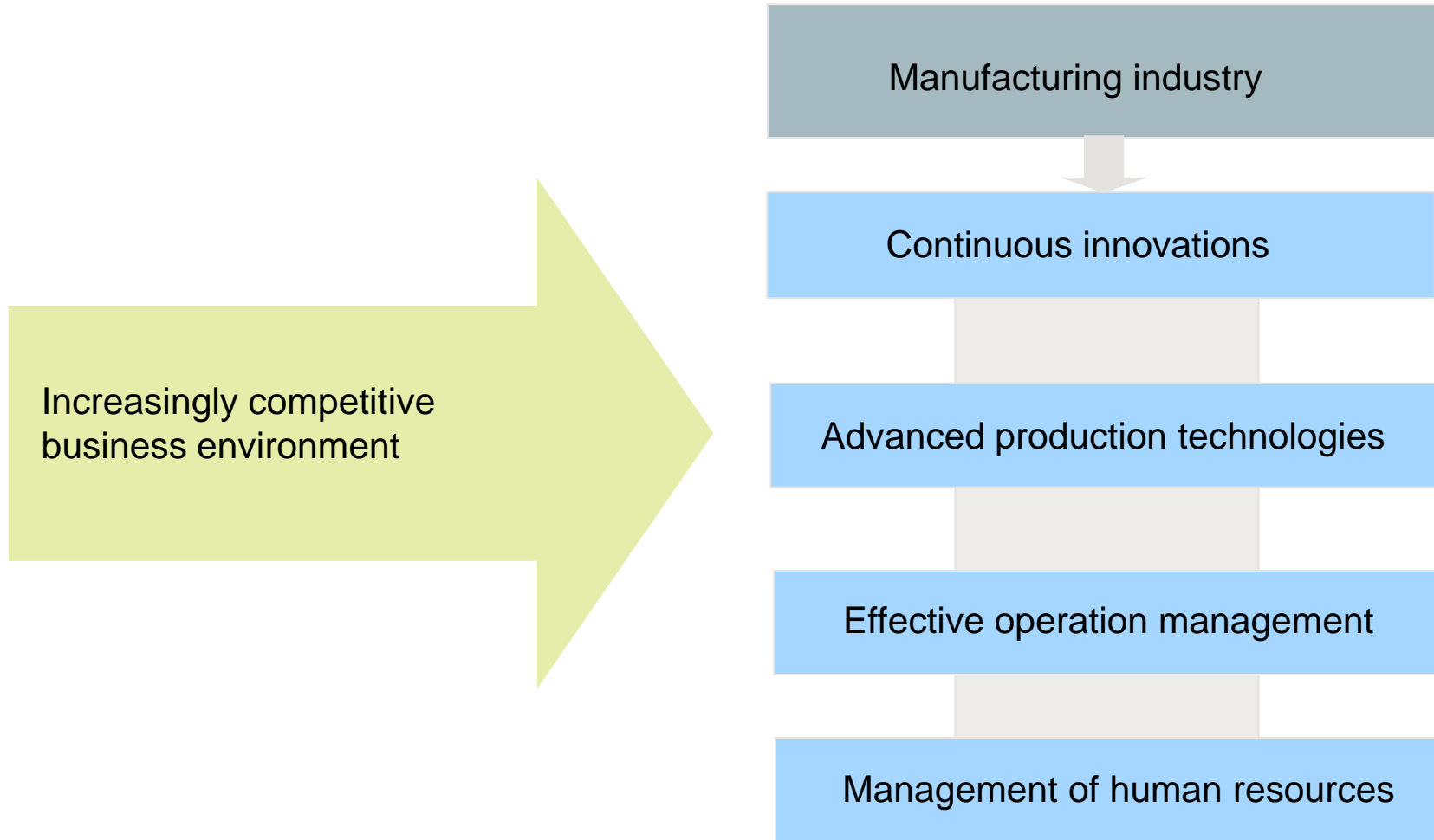
# Emerging trend in production technology

· ATEXCON 2011 ·

· March 2011 Michael Enderle ·

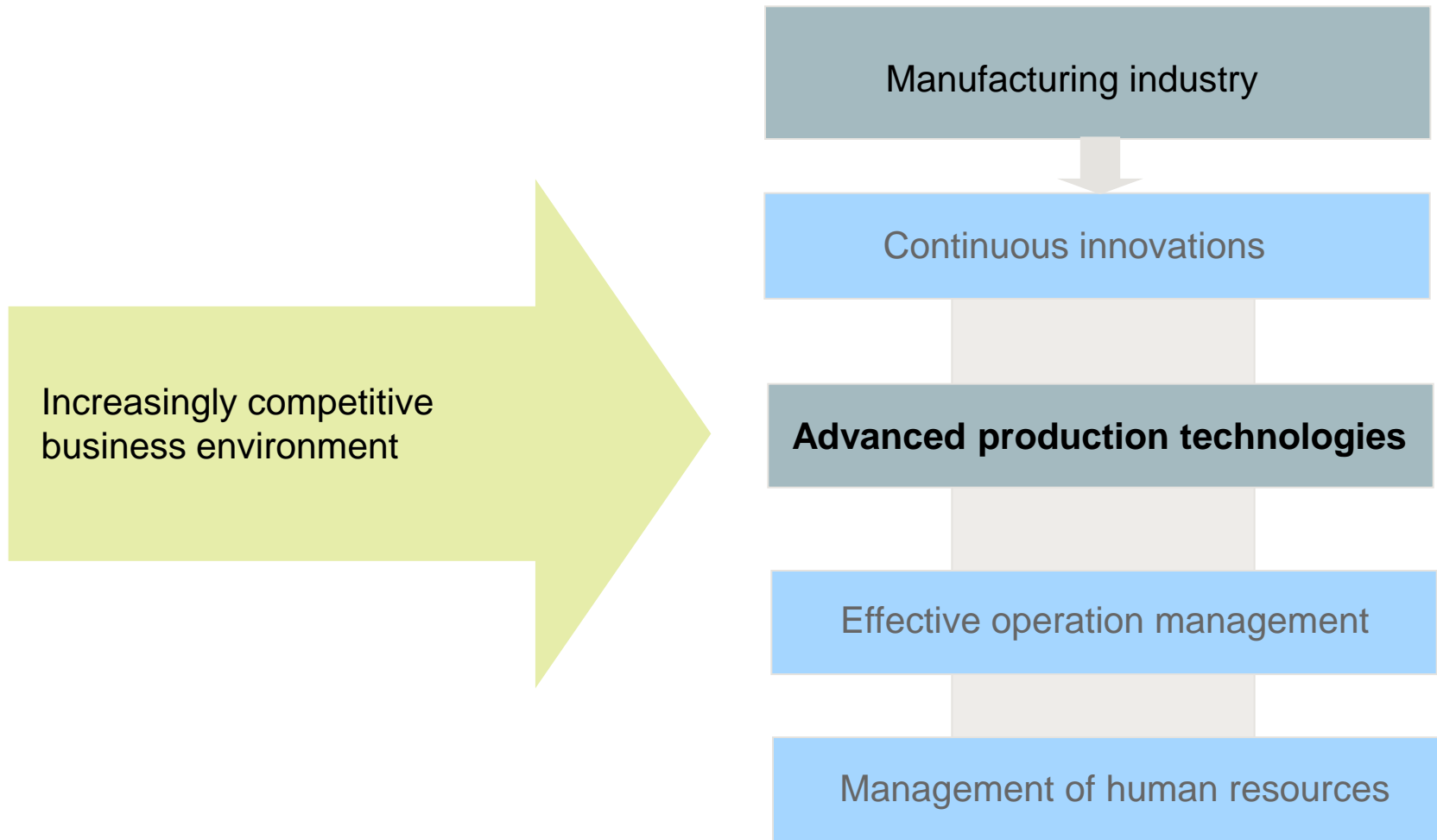
# Introduction

Intensifying competitive pressures have led to continuous innovations



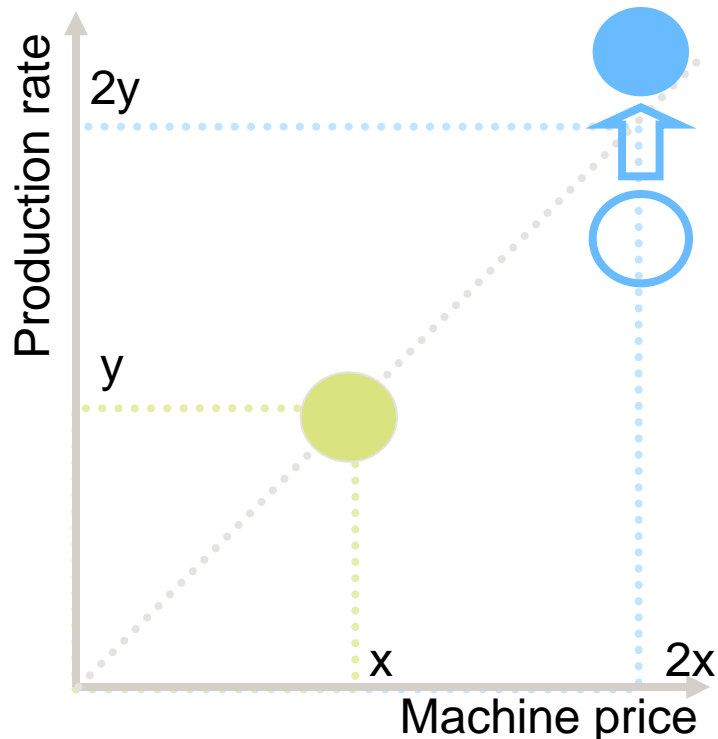
# Advanced production technology

Innovations in production technology has helped the manufacturing industry



# Better price/performance with higher productivity

Innovations for high performance spinning improve the lifetime economics



## Less number of machines

- Reduced number of motors
- Reduced space requirements
- Reduced air conditioning
- Reduced power consumption
- Reduced number of parts
- Reduced maintenance
- Reduced possibilities of faults
- Reduced number of people

## Less total operating costs

# Spinning systems from Rieter



Rieter is the only supplier offer all 4 spinning systems

Ring spinning

Compact spinning

Rotor spinning

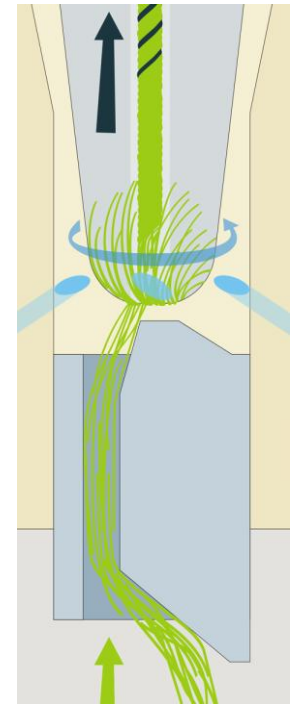
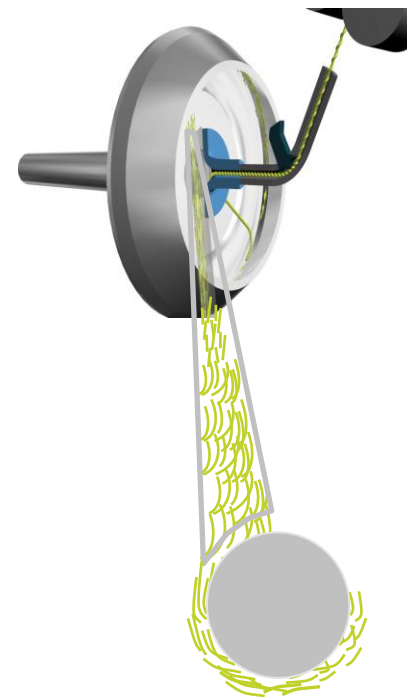
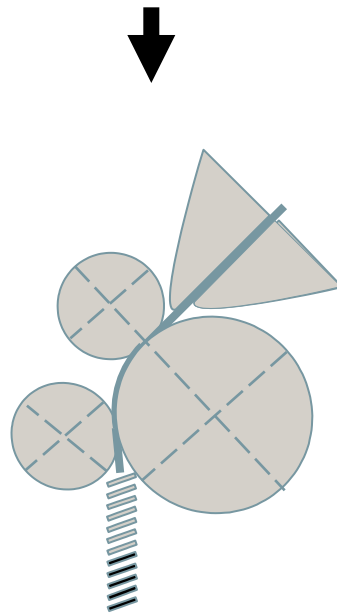
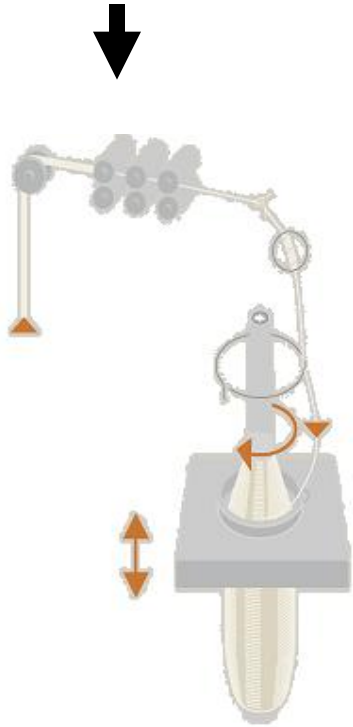
Airjet spinning

Ring Yarn

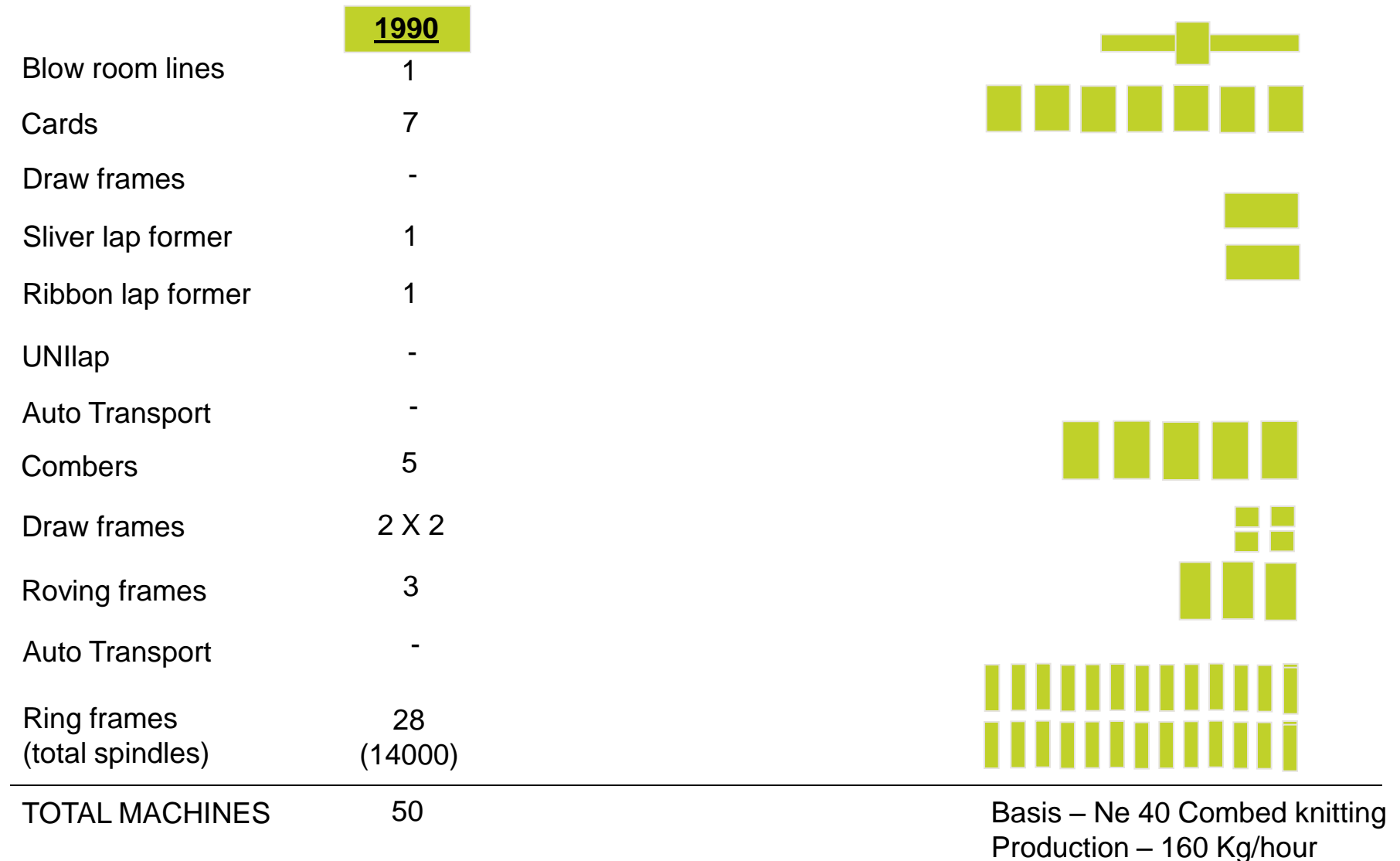
COM4 Yarn

ComfoRo Yarn

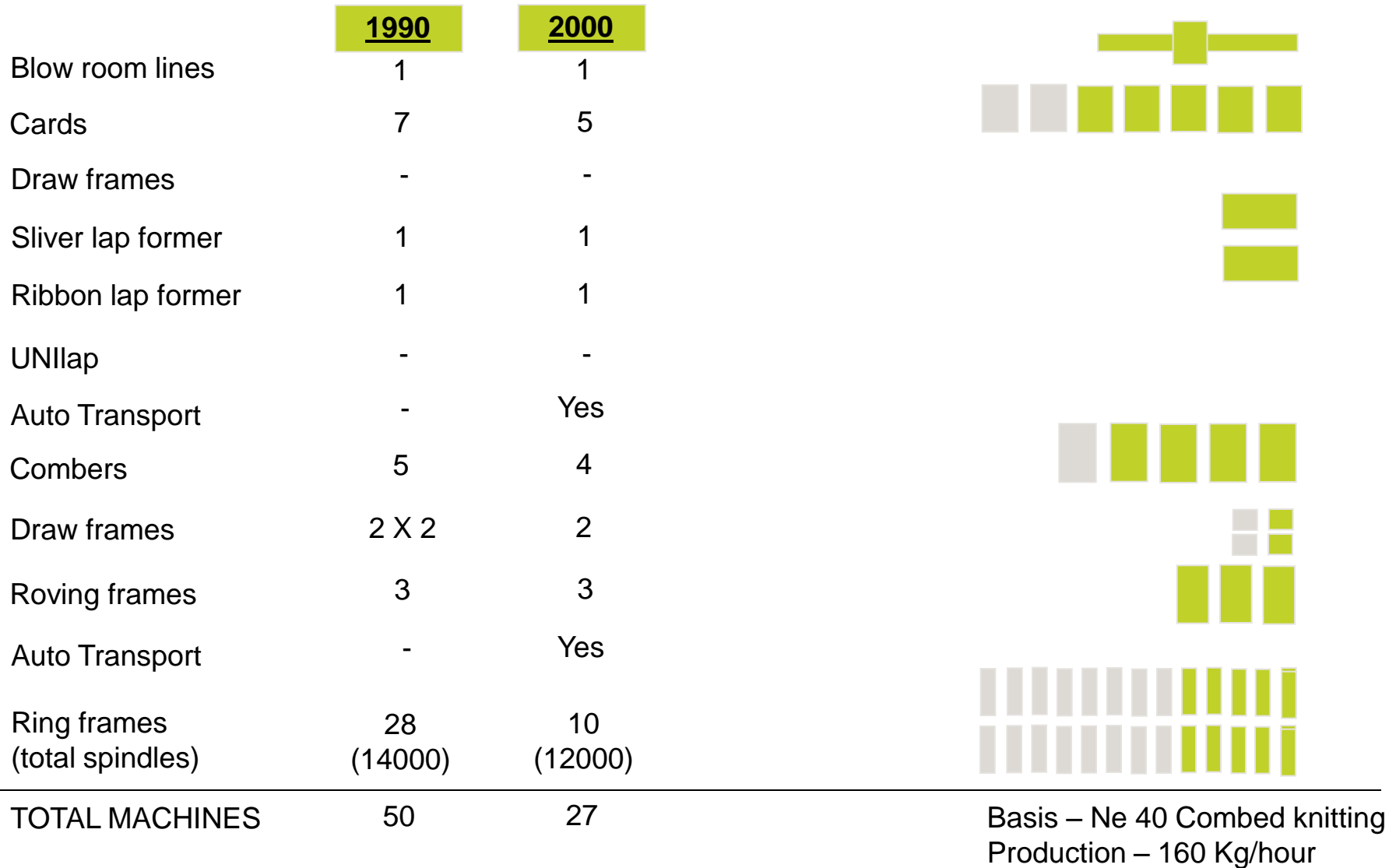
ComforJet Yarn



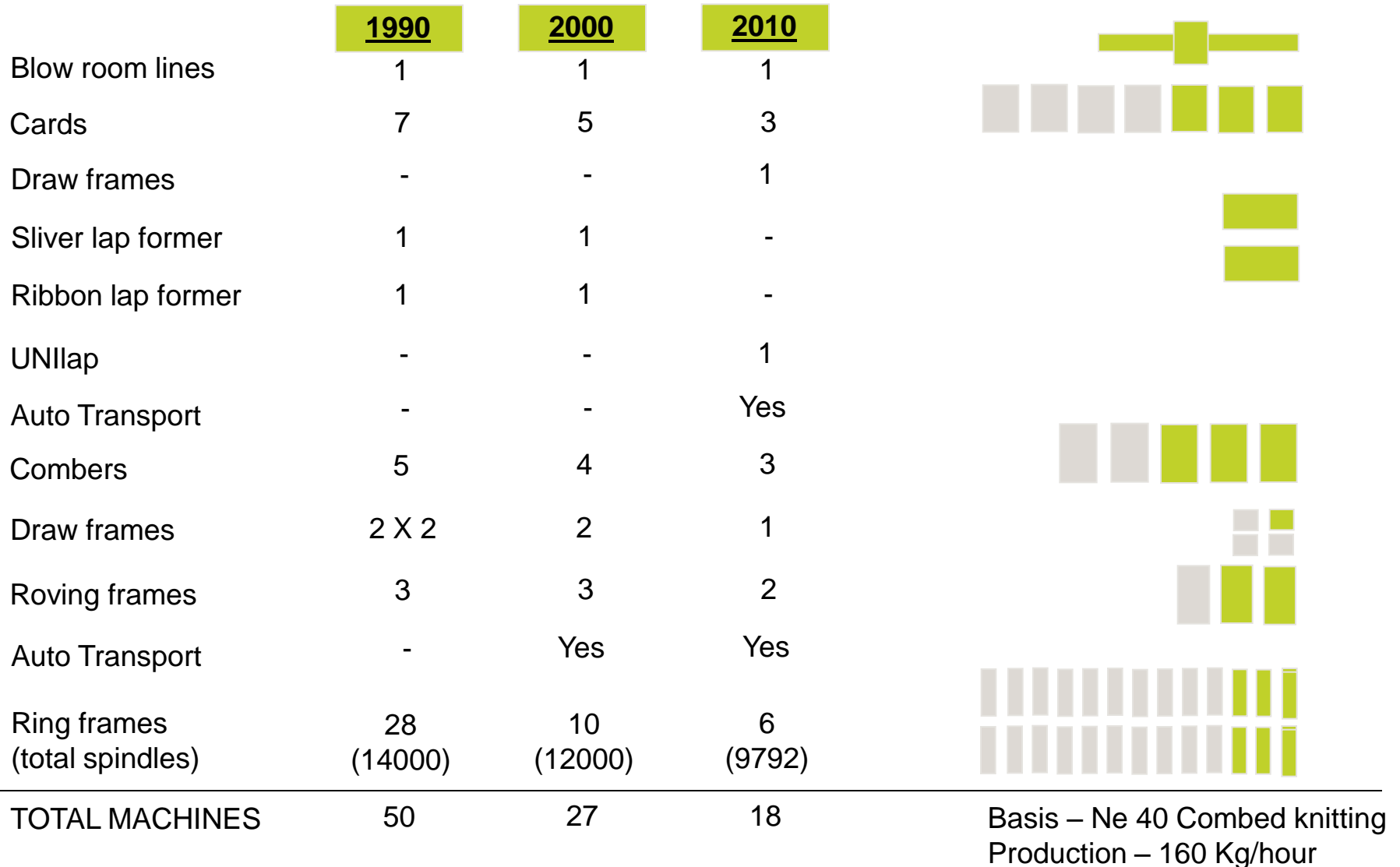
# Technical Progress in Spinning - Productivity



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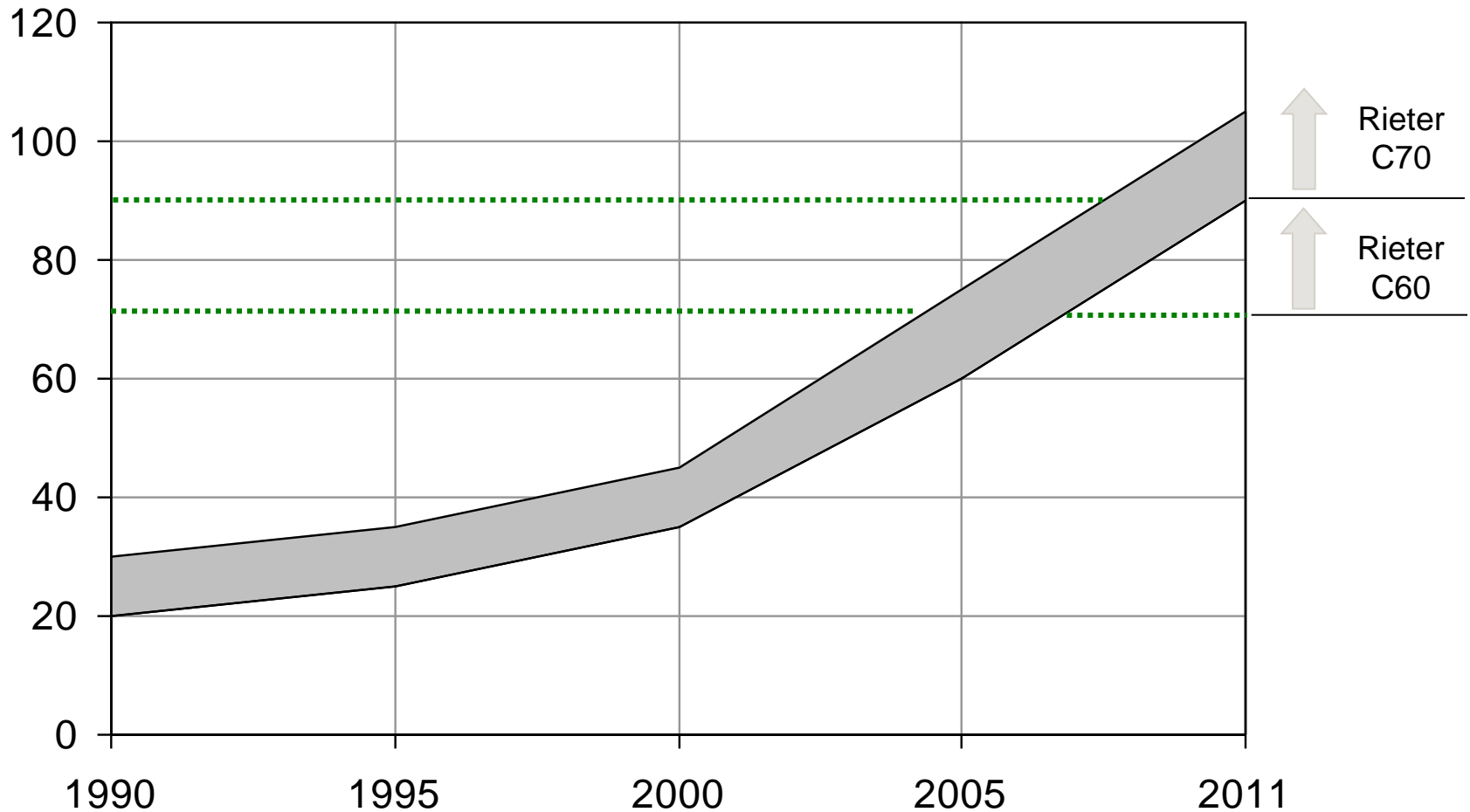


# Innovation in production technology - Cards



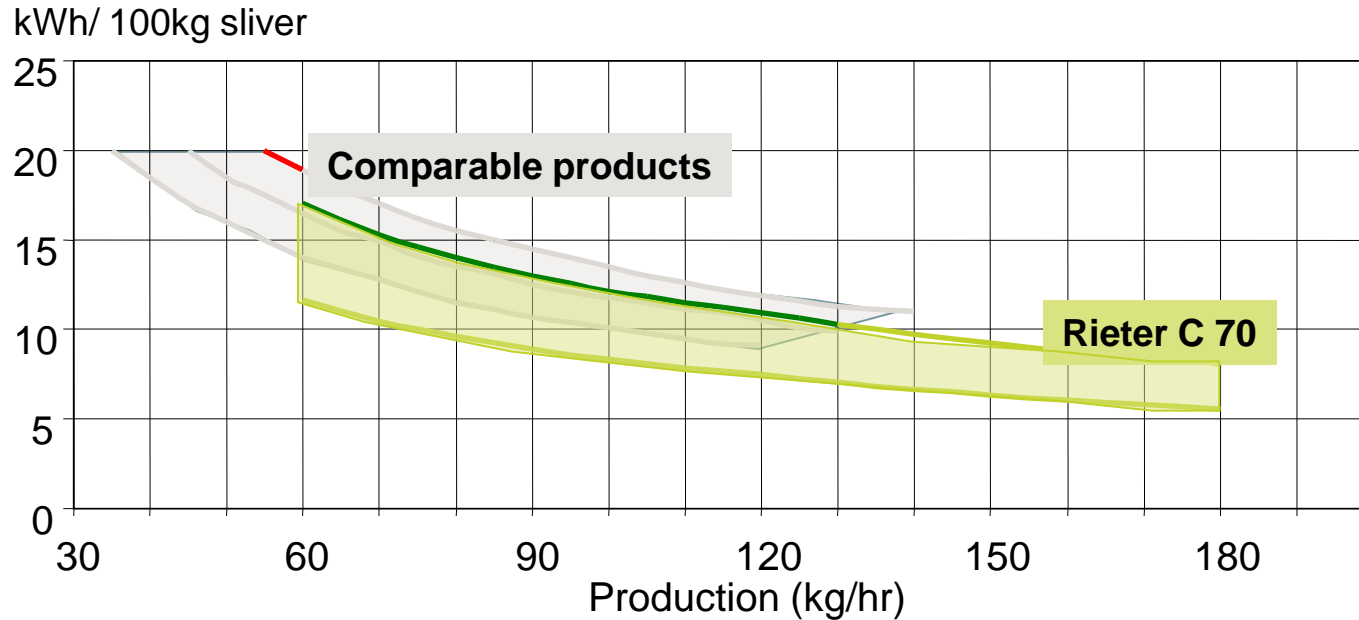
Card productivity has increased by 2.3 times in last 20 years

Practical Production  
Kg/hr



# Innovation in production technology - Cards

Higher production and less power consumption of C70 contributes to lower conversion cost



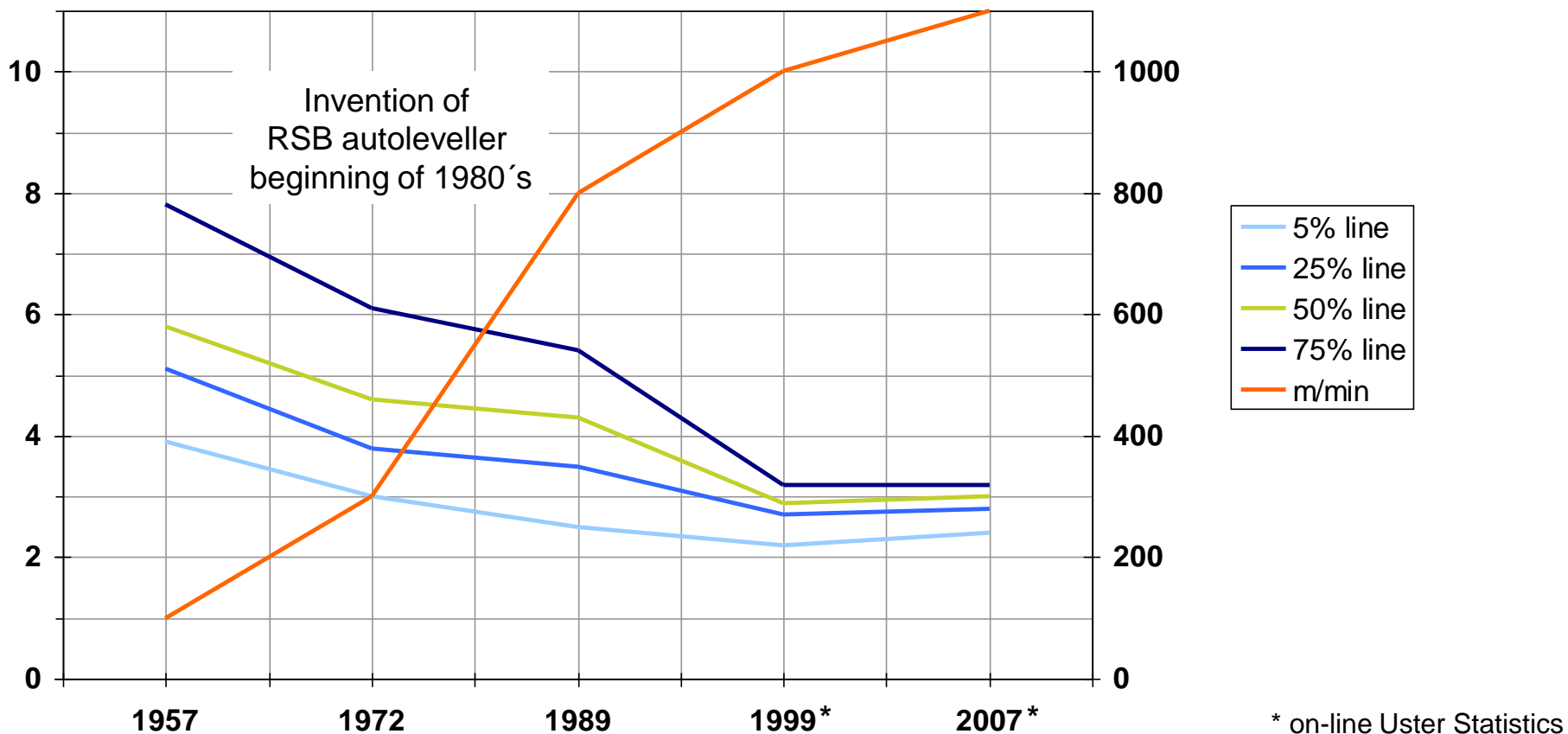
# Innovation in production technology – Draw frames



Productivity increased by 38% in 20 years with improved quality

Sliver evenness CV%  
Uster Statistics 100% CO carded

Draw Frame delivery  
Speed [m/min]



# Rieter Pioneers in the Indian Market



RSB-D 45 Autoleveler Draw Frame



RSB-D 22 Double-Head  
Autoleveler Draw Frame

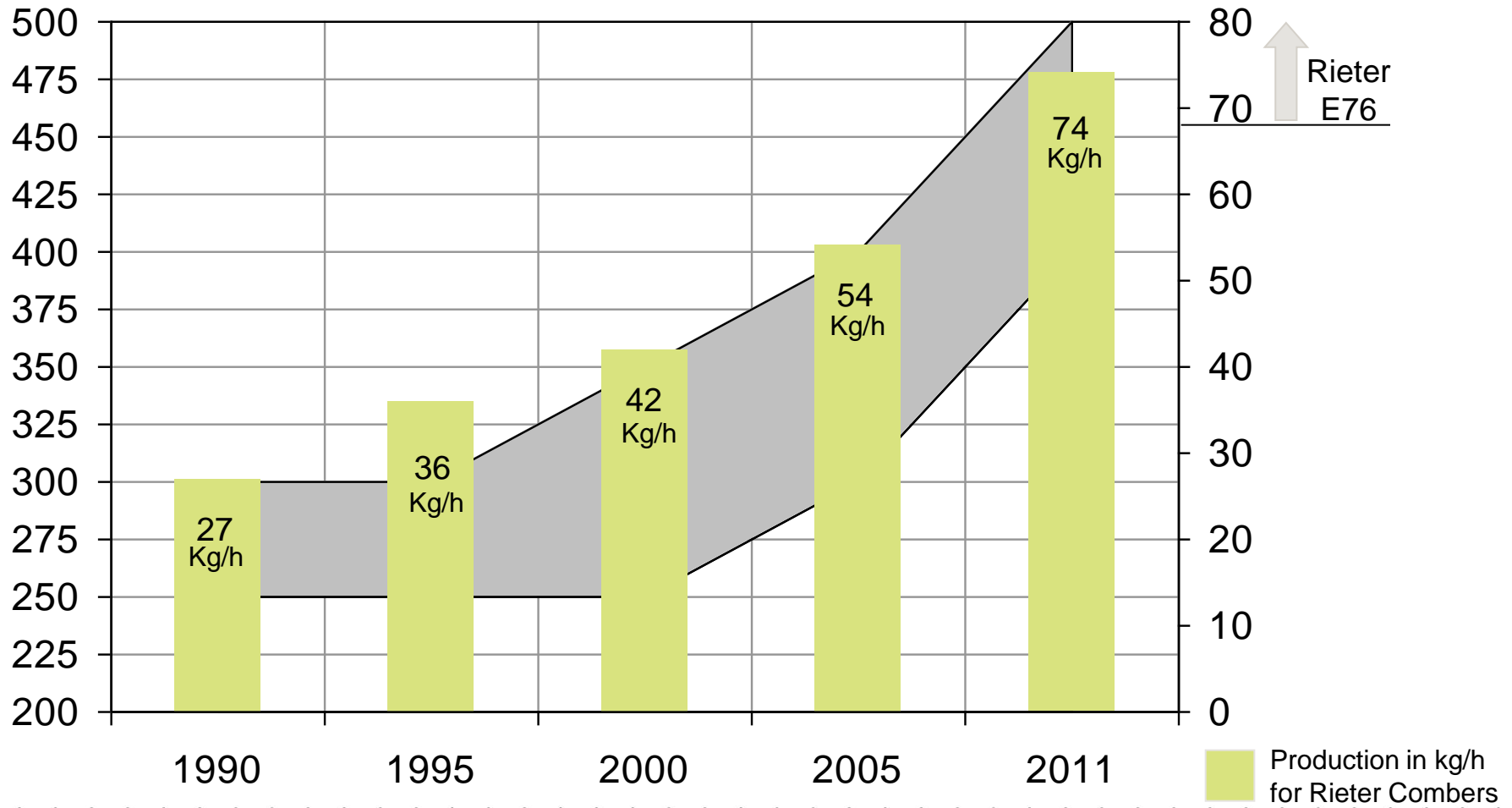
# Innovation in production technology - Comber



Nips per minute has doubled in last 20 years. Kg/h increased by 2.7 times

Nips per minute

Kg/hr

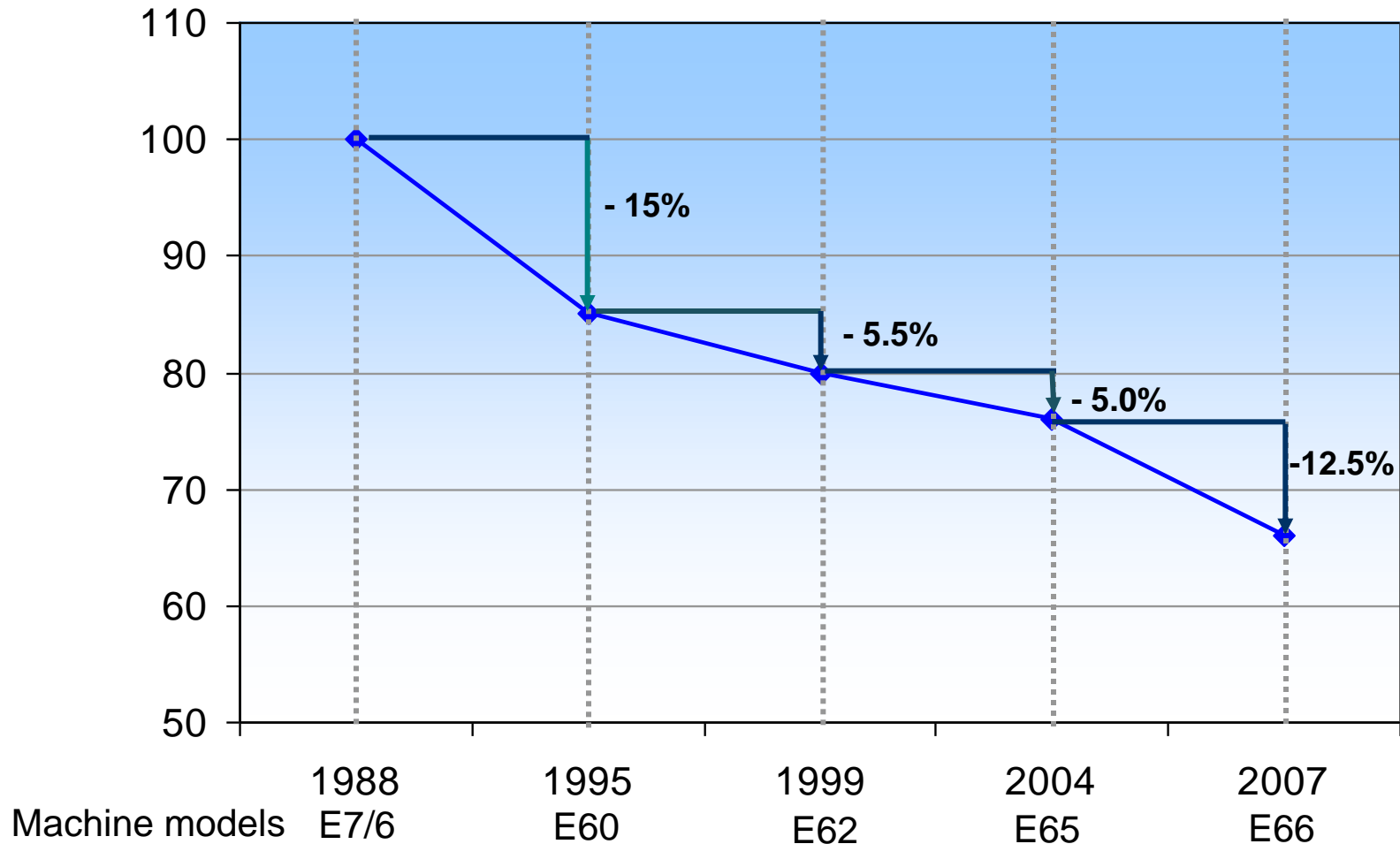


# Innovation in production technology - Comber



Power consumption reduced by 44% in Rieter Combers in last 20 years

KWh / kg of combed sliver (%)



# Innovation in production technology - Comber

## Automation in Combing – way to improve efficiency and quality

Lap transport from lap former



Transport to comber when needed



Empty lap removal, full lap loading



Auto piecing of laps



ROBOlap – Automatic lap changing and batt piecing system

- Reduction of operator effort, improve efficiency by >2%
- Piecing quality improves and increases sliver regularity
- Machine needs only supervision and no operator

SERVOLap – Fully automated lap transport system

- Gentle lap transport and no operator effort required
- No waiting time for Combers
- Higher efficiency on the Comber again

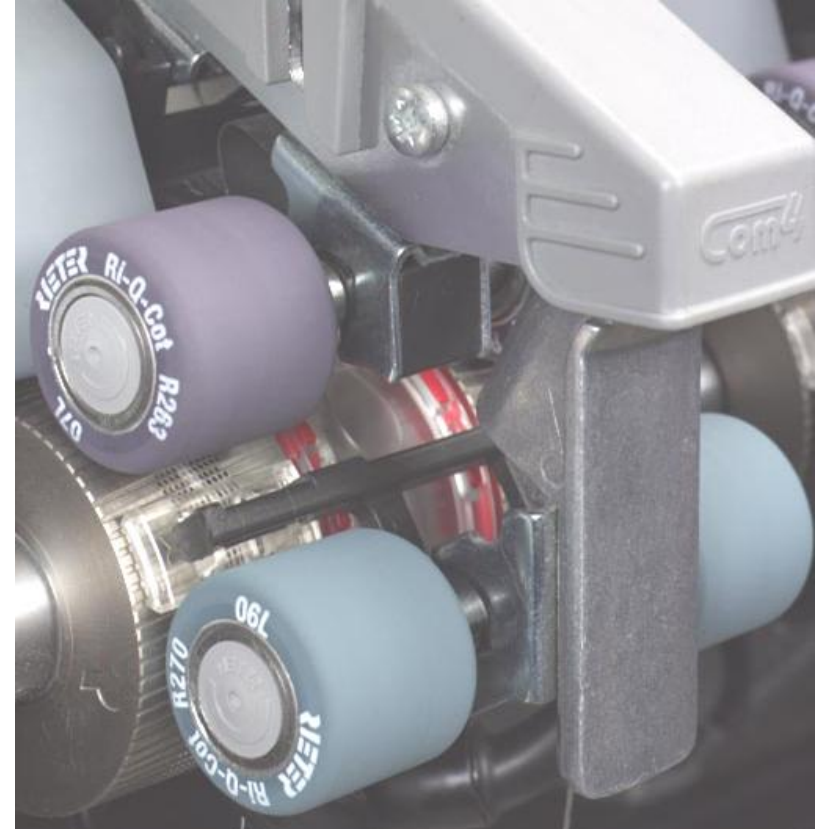
# Innovation in production technology – Compact Spg.



Com4 and EliTe system allows optimization of resources



EliTe Compact System (Suessen)

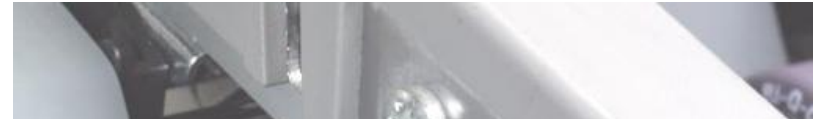


Com4 Compact System (Rieter)

# Innovation in production technology – Compact Spg.



Com4 and EliTe system allows optimization of resources



Spinning Objective 1 = Better quality and higher productivity



Spinning Objective 2 = Higher productivity and raw material savings



EliTe Compact System (Suessen)

Com4 Compact System (Rieter)

# Optimum use of resources in Compact spinning

Spinning objectives – Better quality and higher productivity

|                                       | <b>Conventional</b> <sup>1)</sup> | <b>Compact</b> <sup>2)</sup> |
|---------------------------------------|-----------------------------------|------------------------------|
| <b>Yarn parameters</b>                | Ringspinning                      | Ringspinning                 |
| Yarn count                            | Ne 40                             | Ne 40                        |
| Cotton                                | Shankar 6                         | Shankar 6                    |
| Commercial staple                     | 1 1/8"                            | 1 1/8"                       |
| Application                           | knitting                          | knitting                     |
| Comber noil                           | 15%                               | 15%                          |
| Twist multiplier ( $\alpha_e$ )       | 3.6                               | <b>3.0</b>                   |
| Spindle speed, maximum (rpm)          | 19,300                            | 19,300                       |
| Spindle speed, average (rpm)          | 18,500                            | 18,500                       |
| Production g/spi/8h                   | 146                               | <b>175.7</b>                 |
| Tenacity (cN/tex)                     | 15.67                             | <b>18.32</b>                 |
| $\Sigma$ IPI                          | 96                                | <b>92</b>                    |
| Uster hairiness                       | 4.92                              | <b>3.49</b>                  |
| Ends down/1000 spi.h                  | 60                                | <b>40</b>                    |
| Yarn realisation <sup>3)</sup>        | 74%                               | 74%                          |
| Production/machine/year <sup>4)</sup> | 183,960 kg                        | <b>221,382 kg</b>            |

1) Rieter G 331,  
 2) Rieter K 441 Com4  
 3) kg yarn in %  
 out of 1 kg cotton,  
 4) 1200 spindles,  
 8400h/year

# Optimum use of resources in Compact spinning



Spinning objectives – High production and raw material savings

|                                       | Conventional <sup>1)</sup> | Compact <sup>2)</sup> |
|---------------------------------------|----------------------------|-----------------------|
| <b>Yarn parameters</b>                | Ringspinning               | Ringspinning          |
| Yarn count                            | Ne 40                      | Ne 40                 |
| Cotton                                | Shankar6                   | Shankar 6             |
| Commercial staple                     | 1 1/8"                     | 1 1/8"                |
| Application                           | knitting                   | knitting              |
| Comber noil                           | 15%                        | <b>12%</b>            |
| Twist multiplier ( $\alpha_e$ )       | 3.6                        | 3.0                   |
| Spindle speed, maximum (rpm)          | 19,300                     | 19,300                |
| Spindle speed, average (rpm)          | 18,500                     | 18,500                |
| Production g/spi/8h                   | 146                        | 175.7                 |
| Tenacity (cN/tex)                     | 15.67                      | <b>18.00</b>          |
| $\Sigma$ IPI                          | 96                         | <b>119</b>            |
| Uster hairiness                       | 4.92                       | <b>3.62</b>           |
| Ends down/1000 spi.h                  | 60                         | <b>45</b>             |
| Yarn realisation <sup>3)</sup>        | 74%                        | <b>77%</b>            |
| Production/machine/year <sup>4)</sup> | 183,960 kg                 | 221,382 kg            |

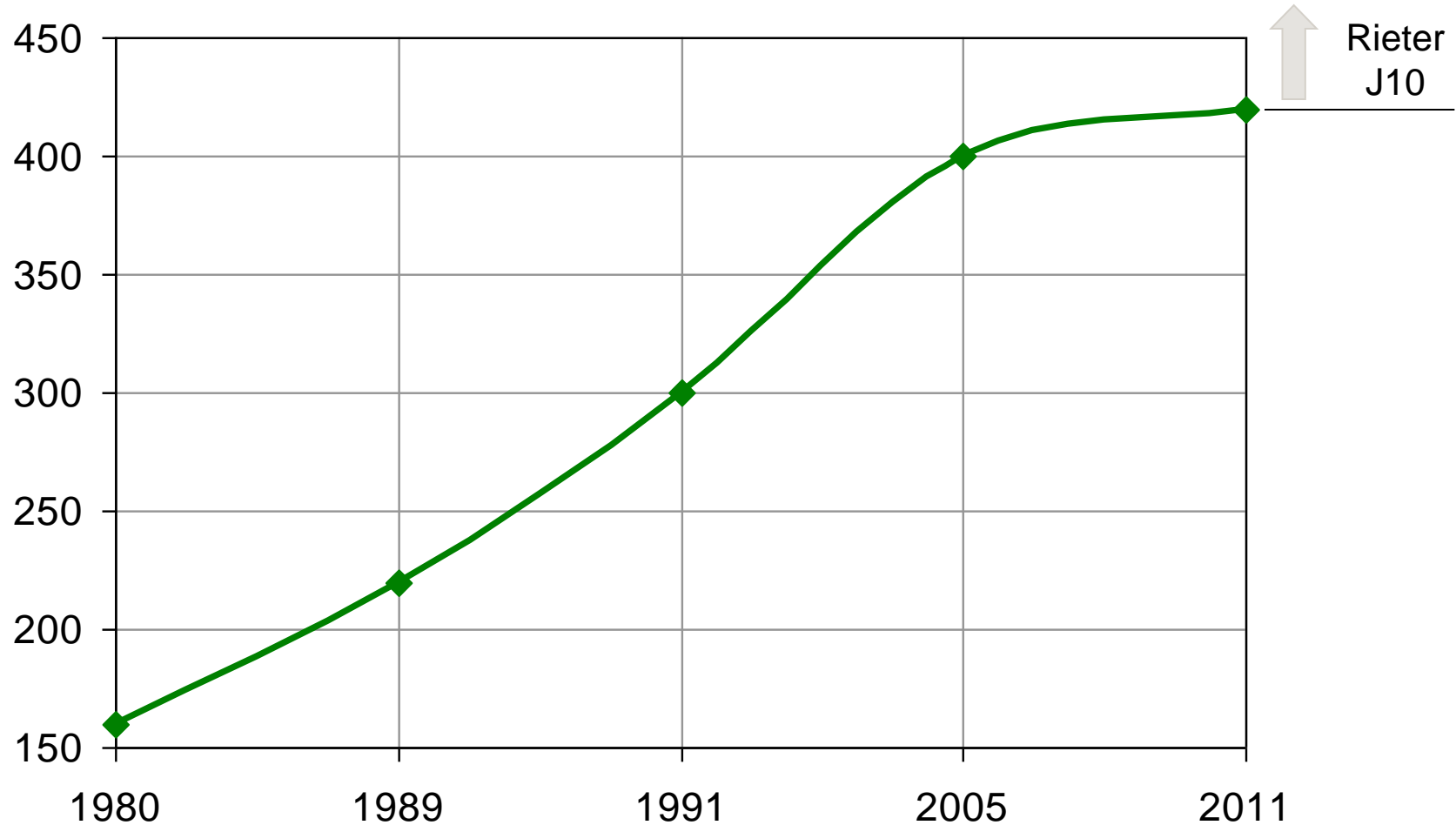
- 1) Rieter G 331,
- 2) Rieter K 441 Com4
- 3) kg yarn in % of 1 kg raw cotton
- 4) 1200 spindles, 8400h/year

# Innovation in production technology – Comfor Jet



The new concept of Air jet spinning can go up to 450m/min

Delivery speed  
m/min



# Concept of J 10 Air-Jet Spinning Machine

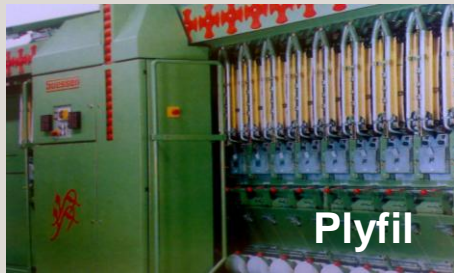
J 10 machine concept for a premium yarn with high productivity



Rotor



Automation  
Machine concept



Plyfil



Robot components



Ring



Drafting

The best of all



Rieter J 10

new Air-Jet technology

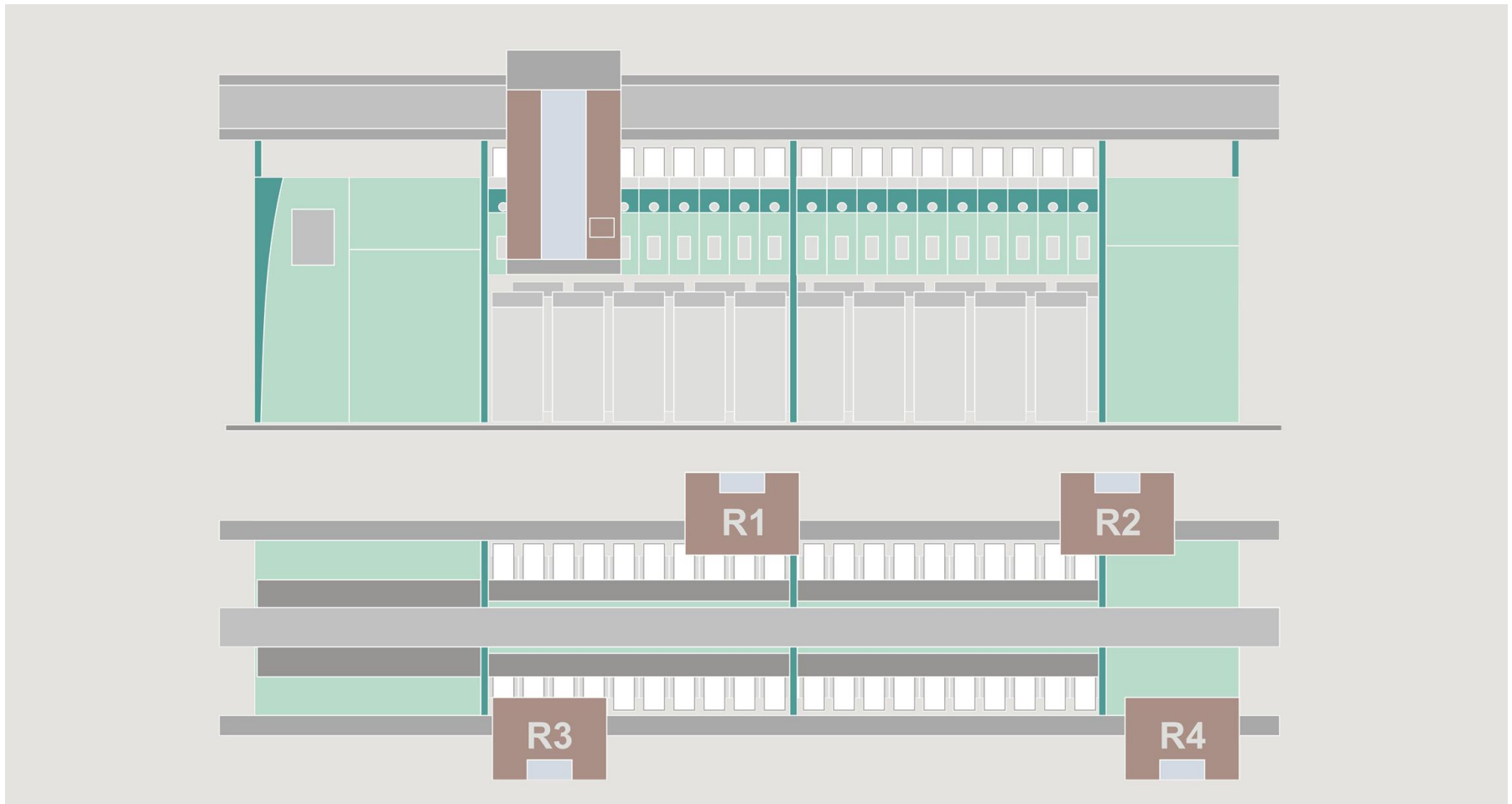
- Machine: Rieter J 10
- Yarn: ComforJet Yarn
- Process: ComforJet Spinning
- Technology: Air-Jet



J 10 Air-Jet machine

# Concept of J 10 Air-Jet Spinning Machine

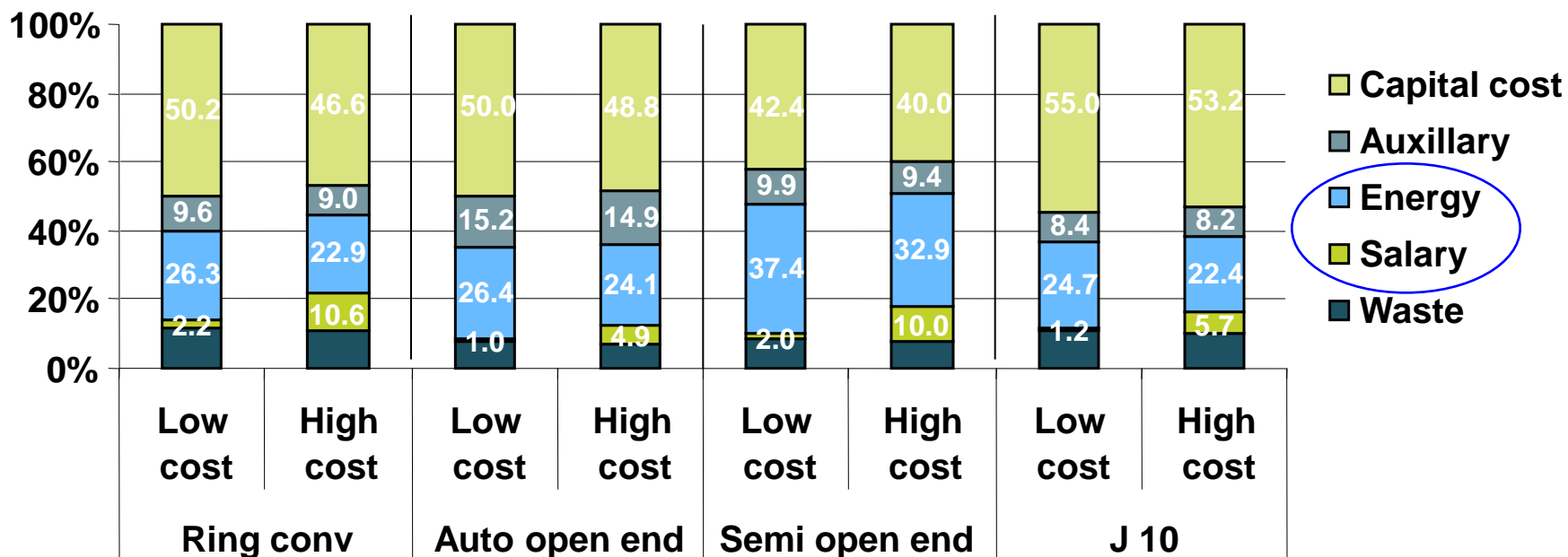
J 10 design – double sided machine concept with cans under the machine



# Concept of J 10 Air-Jet Spinning Machine

Conversion cost comparison – low cost Vs high cost countries

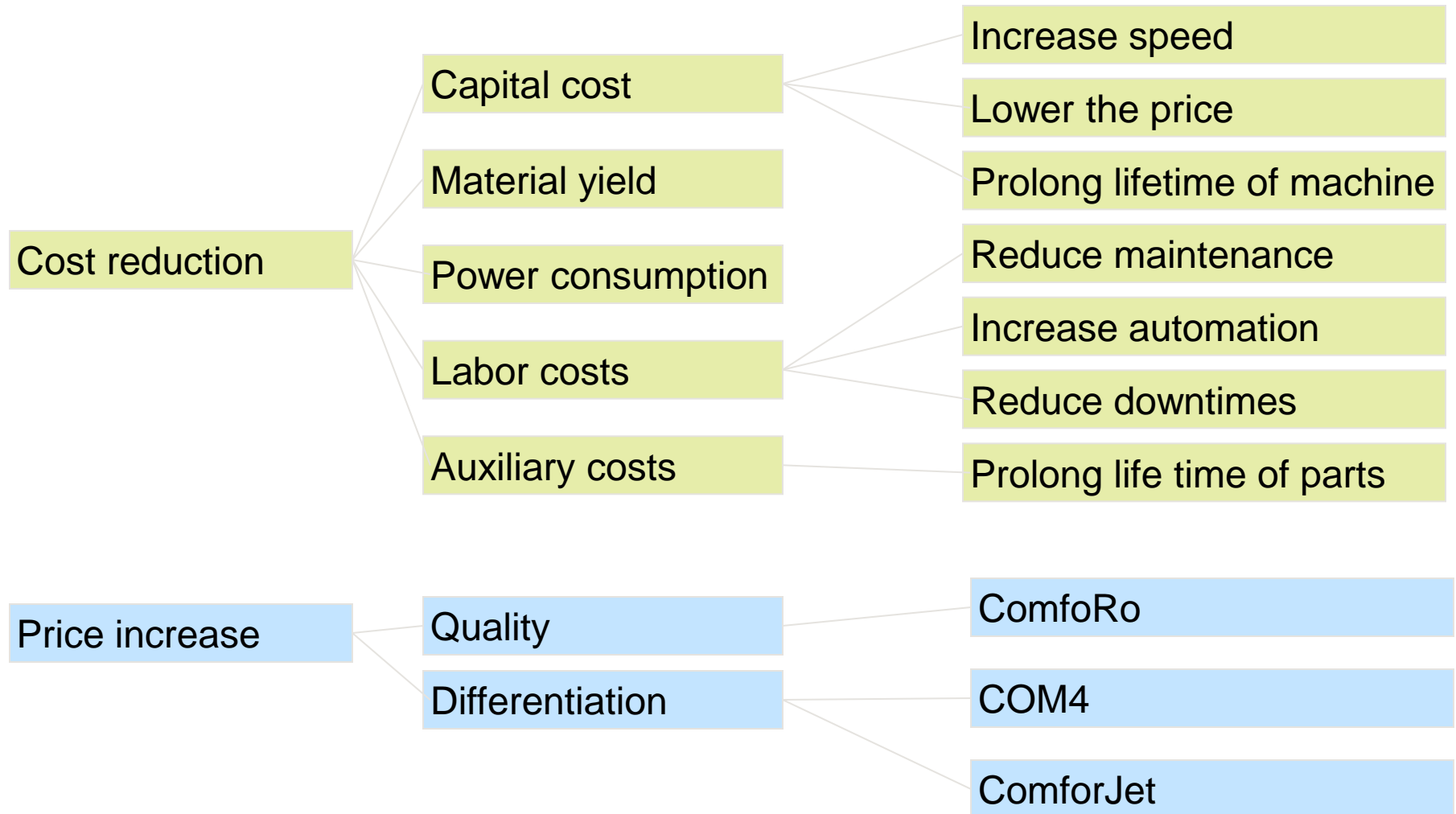
Ne 30, 65/35% P/C



➤ The advantage of J10 Air-jet spinning with respect to energy and labour cost is possible in both low and high wage countries over other spinning systems in its area of application.

# Drivers for advanced production technologies

## Increase Price Performance ratios





# Thank you