

**2015
MANUFACTURING:
A STRATEGIC ADVANTAGE
FOR THE COMPANY**



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Outline

- **1st challenge:**
Continuously optimize production costs
- **2nd challenge:**
*Activate new performance levers
for global manufacturing*



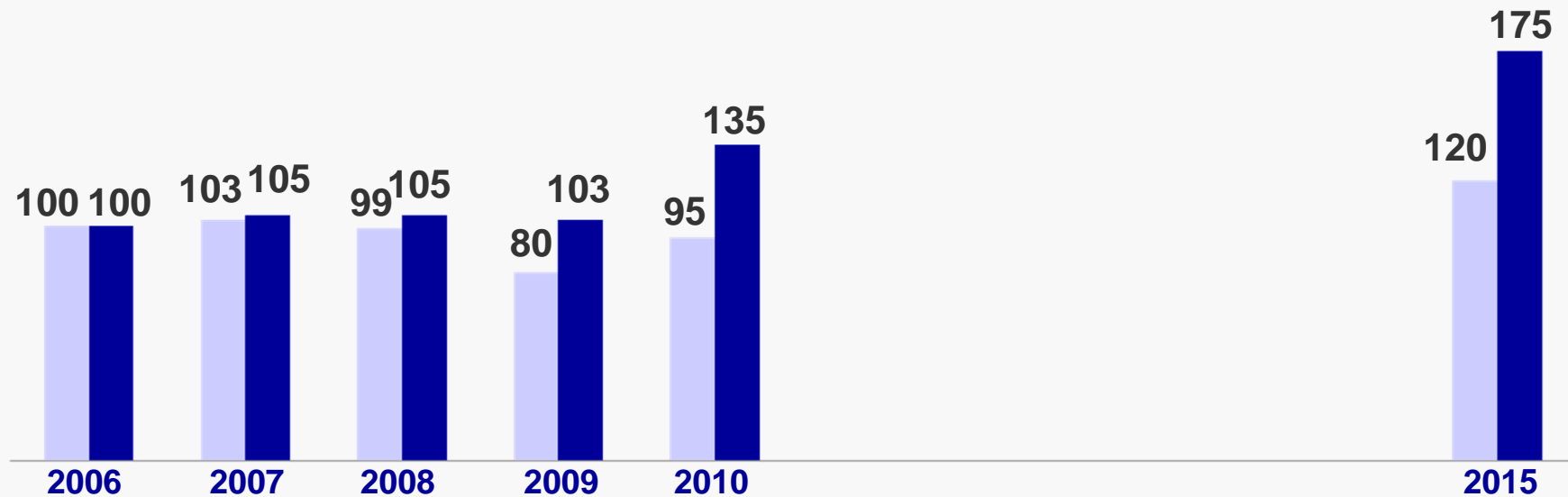
Continuously Optimize Production Costs





Optimizing Production Costs

*Focus maintained on productivity
Productivity gains since 2006 (Base 100 in 2006)*



2005 / 2010: continuous progress + industrial footprint
2011 / 2015: continuous progress + growth

■ Production ■ Tons per employee





MMW: Lever for Continuous Improvement

- ▶ **Four fundamentals of the Michelin Manufacturing Way:**
 - The professionalism of our trained, skilled people, who embrace and rigorously apply tools and methods.
 - The leadership of our managers, who get involved on the shop floor, lead by example and coach their teams.
 - A commitment to leading by example. All tools and best practices come straight from the plants.
 - A focus on team spirit. The most advanced plants help the others improve by sharing their expertise.

Each team is accountable for its KPI performance



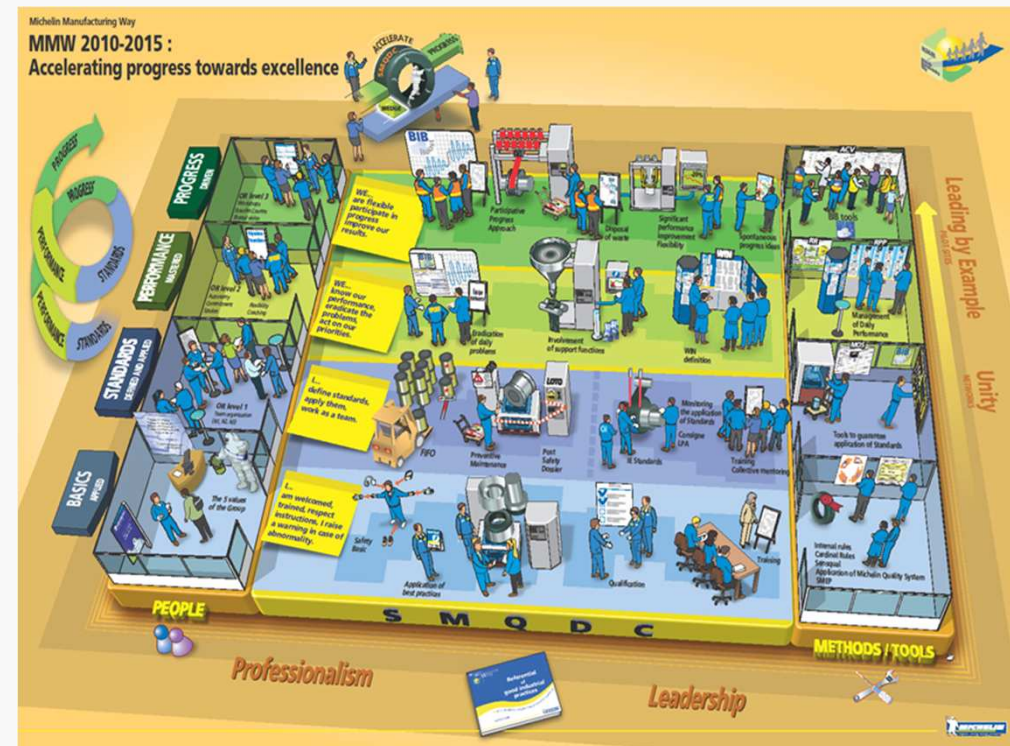


MMW: Lever for Continuous Improvement

2005 / 2010 examples of savings through continuous improvement

Savings on lost days following accidents: equivalent to annual wage + salary costs of one plant.

Savings on scrapping: equivalent to the operating costs of a second plant.





MMW: Lever for Continuous Improvement

► The next step:

Accelerate team empowerment at all levels:

- Business Unit
- Shop
- Activity and Industrial Teams

People become multi-functional and autonomous in managing their daily work.

This contributes to individual well-being and development, as well as enhanced flexibility and responsiveness.

Key lever to meet plant economic target





New Objectives for Optimizing Production Costs

▶ Energy:

- In 2015 (price + volume effect):

- Cost of energy = 1.6 x 2010 cost of energy
- In low-wage countries, cost of energy = manufacturing labor costs

➔ Objective: reduce consumption by 20% by 2015

▶ Tire mass:

- 2011: raw material cost = 1.5 x production cost
- The right mass at the right place!

➔ Objective: remain leader in raw material use through our process control



New Performance Levers for Global Manufacturing



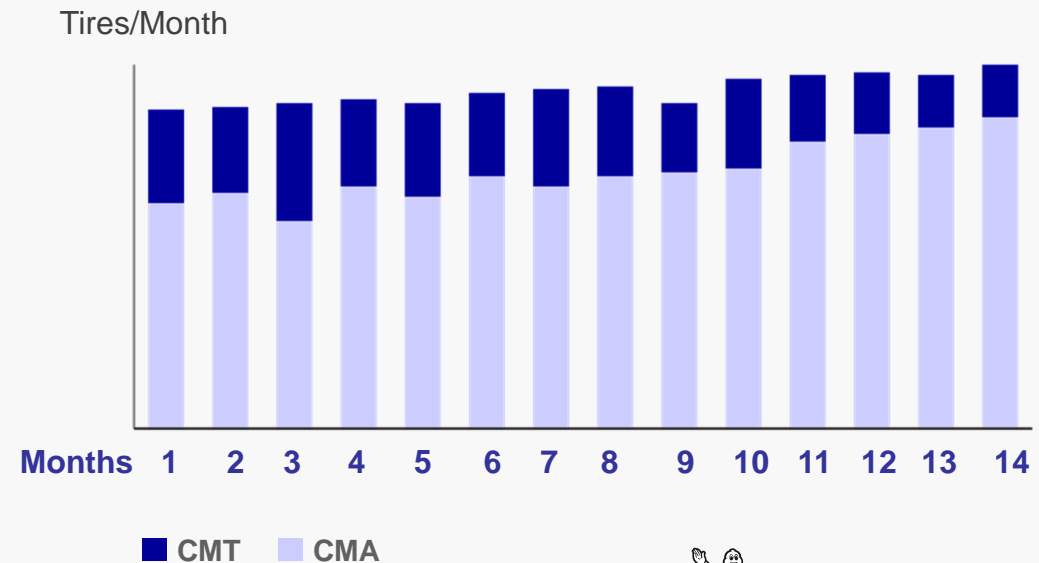


New Improvement Levers: 1- Maximized Use of Existing Assets

- ▶ **Maximum theoretical capacity (CMT):** No shutdowns, no scrapping, no breakdowns during the year.
- ▶ **Maximum available capacity (CMA):** Actual annual capacity.
- ▶ **Objective for 2015:** increase by 10% CMA/CMT ratio for existing assets. This means more than 300 KT of new production capacity with existing assets.

- ▶ **Levers:**

- Open days
- Scrapping
- Breakdowns
- Bottleneck management
- Debottlenecking

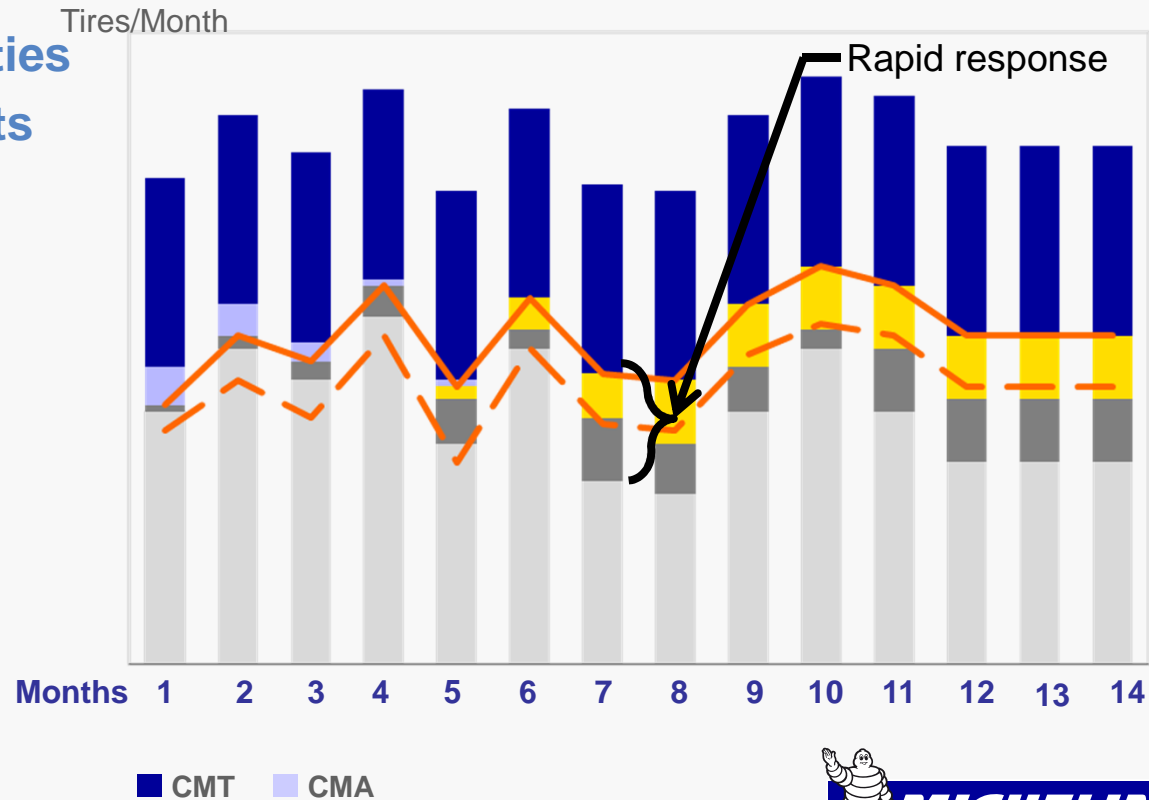




New Improvement Levers: 2 – Rapid Response

► Levers:

- Calendar adjustments
- Overtime
- Polyvalent capabilities
- Temporary contracts
- Inter-plant bridges
- Other





New Improvement Levers: 2 – Rapid Response

▶ Objectives for 2015:

- **Maintain demonstrated ability for respect of semi-proportionality of costs versus production, on an increased range of variation.**
- **Respond more rapidly in each market segment.**

Passenger Car Winter, SUV, Light Truck, High Performance, etc.



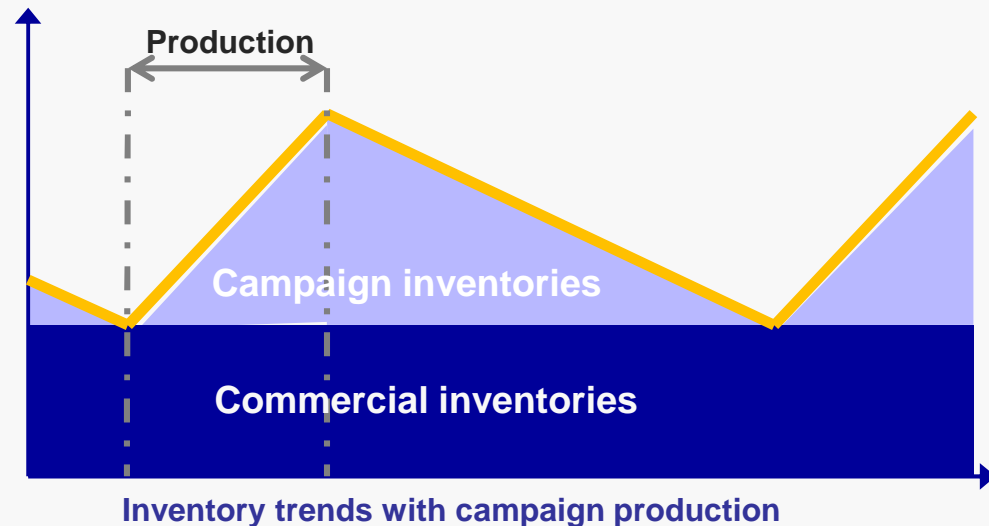


New Improvement Levers: 3 - Flexibility

- ▶ Ability to produce exactly what's needed.
- ▶ Some tires are produced continuously.
- ▶ Others are produced in “campaigns” (e.g.: twice a year), due to a lack of manufacturing flexibility. This results in a need for “campaign inventories”.

Objective for 2015:

**Reduce the need for
“campaign inventories”
by 50%
(i.e ~€300M W.C.)
iso portfolio**





New Improvement Levers: 3 - Flexibility

- ▶ **IFP = Scheduling Flexibility Index** (Directly correlated to campaign inventories):
- Number of SKUs in the portfolio **N**
 - Proportion of the portfolio that is produced every day **C**
 - Number of SKUs produced simultaneously **S**
 - Number of production changes per week **CD**

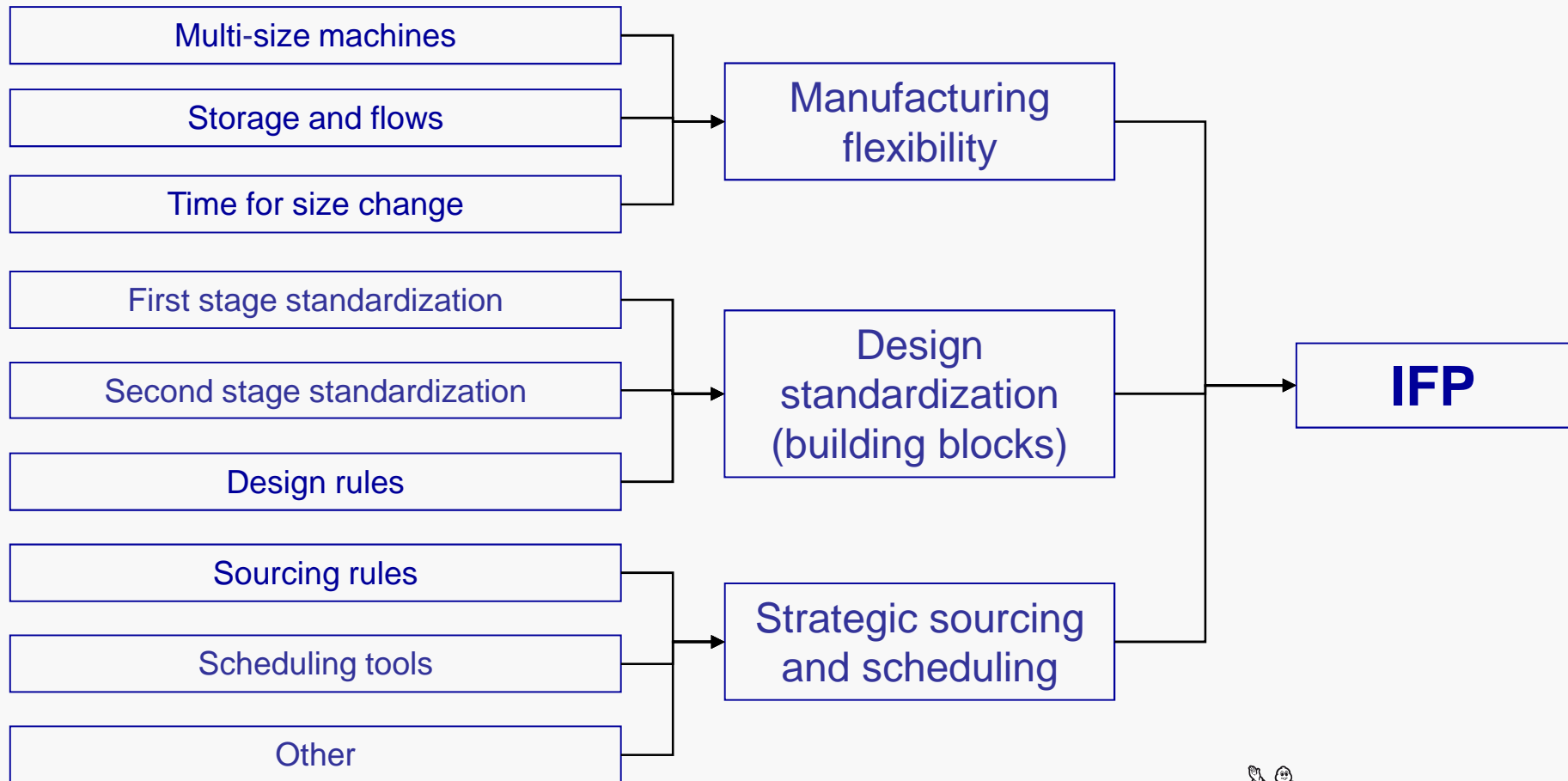
$$\text{IFP} = (1 - C) \times (N - S) / CD$$





New Improvement Levers: 3 - Flexibility

Levers of manufacturing flexibility





New Improvement Levers: 3 - Flexibility

The overall stakes of manufacturing flexibility

