

# **Automobile Painting in the BRIC Countries - Quality at low Cost -**

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# Automobile Painting in BRIC Countries

**Quality at low Cost ?**

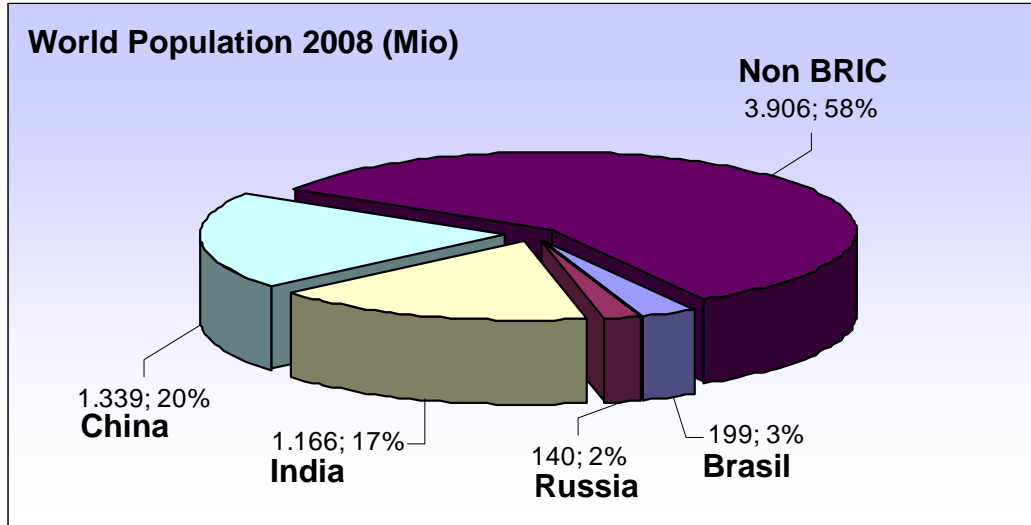
**Appropriate Quality + Low investment + low running costs**

- Corrosion protection
- Appearance
- Colour palette/Effects
- Quality constancy

- Reduced plant footprint
- Lean process

- Energy reduction
- Reduced material consumption
- Automation
- Low complexity equipment

# BRIC Countries: Emerging Markets ?



- 42% of world population
- Highest population growth in Asia



## BRIC



Brazil



Russia

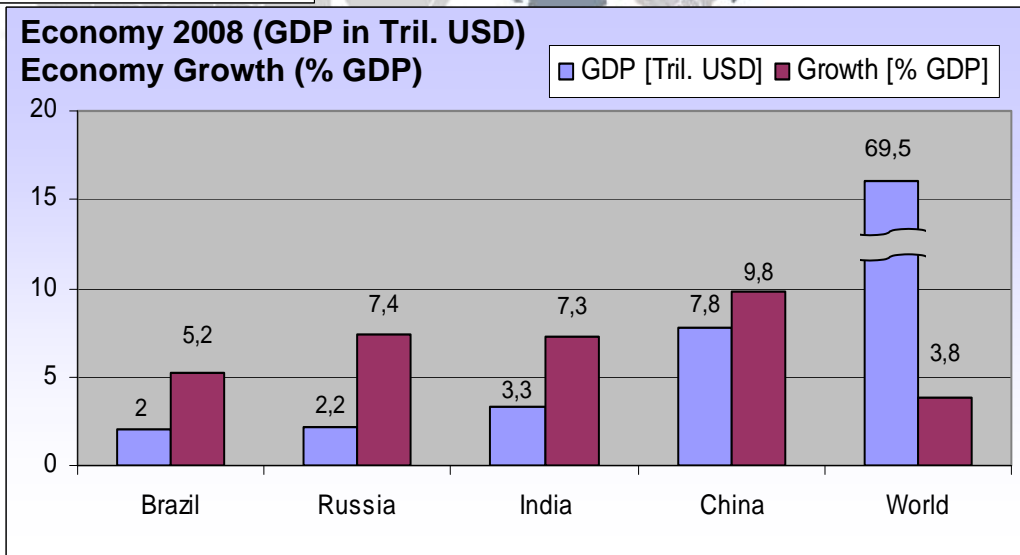


India



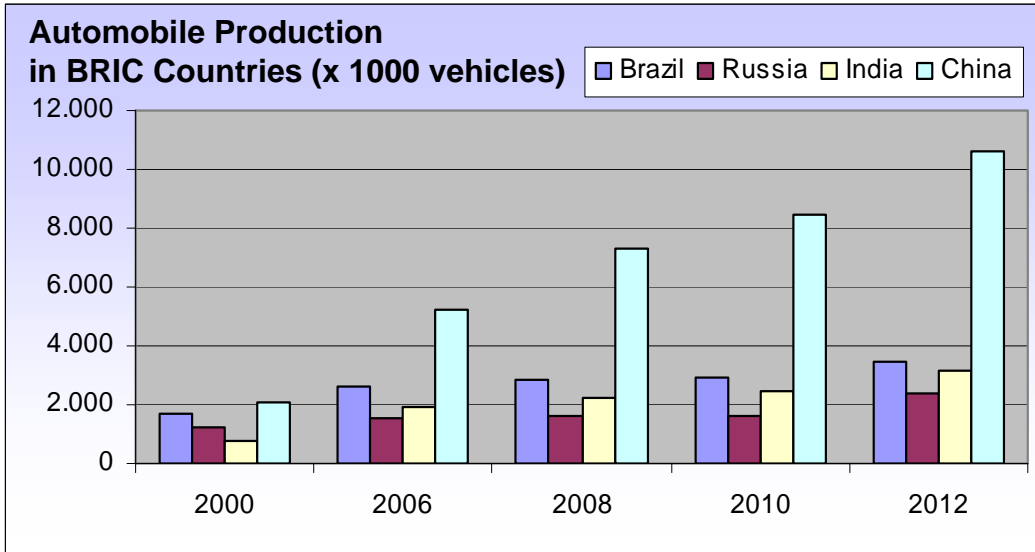
China

- 22 % of world GDP
- Highest economical growth



Source: CIA, The World Factbook

# BRIC Countries: Emerging Markets ?



- 24 % of automobile production (2008)
- Production growth shifting to BRIC countries



**BRIC**



Brazil



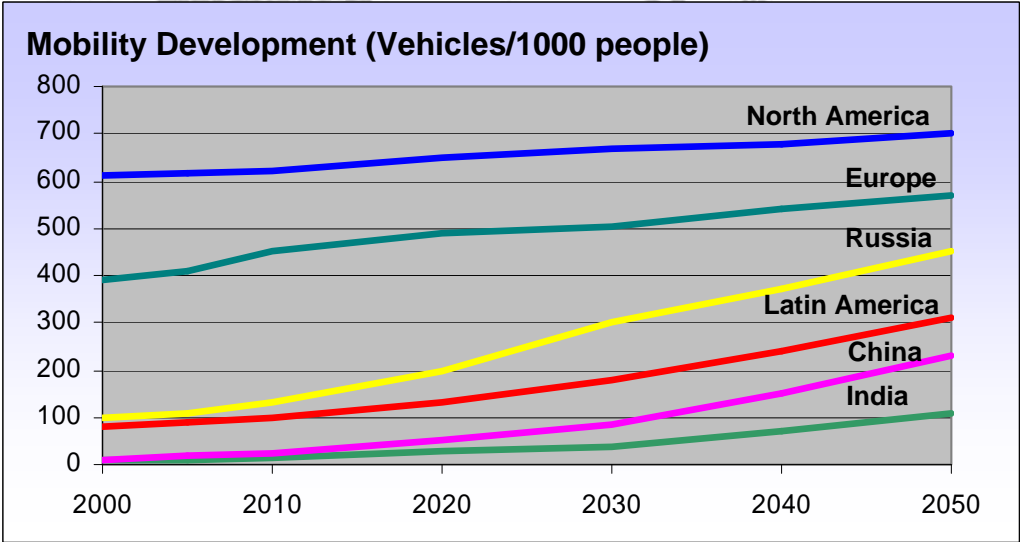
Russia



India

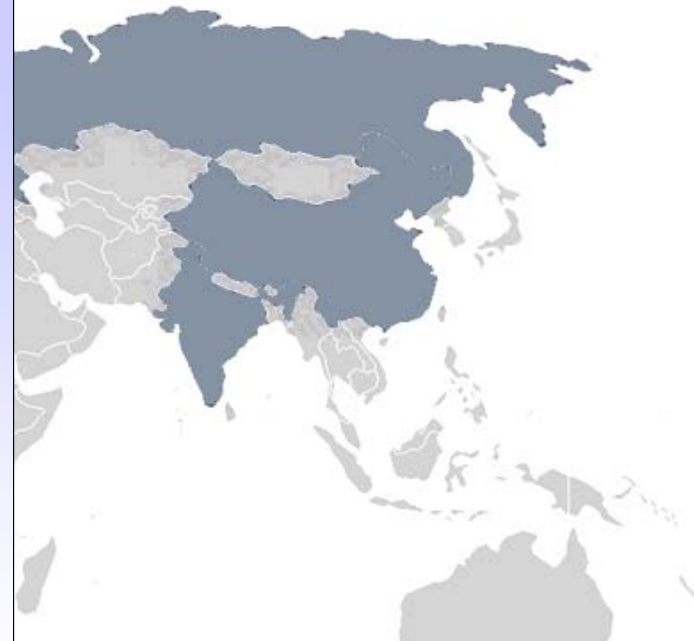
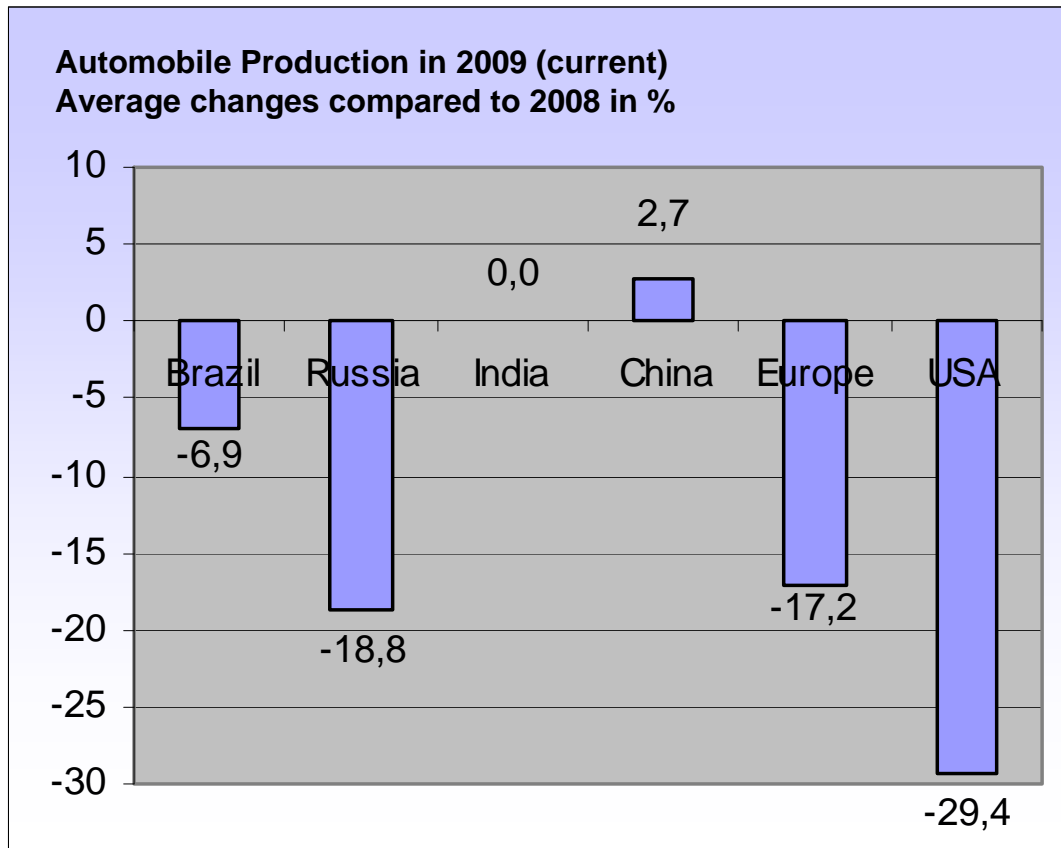


China



- Highest growth expected in Russia, Latin America, China

# BRIC Countries: Emerging Markets ?



## BRIC



Brazil



Russia



India



China

**Actual forecast in economical slowdown**

- Strong negative growth in Europe and USA
- Still positive growth in China

# Vehicle Characteristics / Market Demands

## BRIC Countries

- Robust
- Simple
- Low costs
- No need for individuality
- Reliable
- Low consumption

New group of consumers



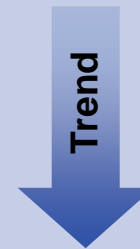
- Ultra low segment
- “Luxury“ low cost
- Fair quality level



## Established Markets

- High quality
- High efficiency
- High reliability
- High safety standards
- High individuality

Shift within the consumer group

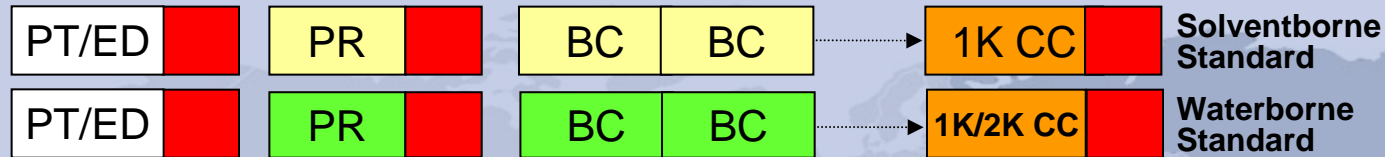


- Low cost segment
- Fair quality level

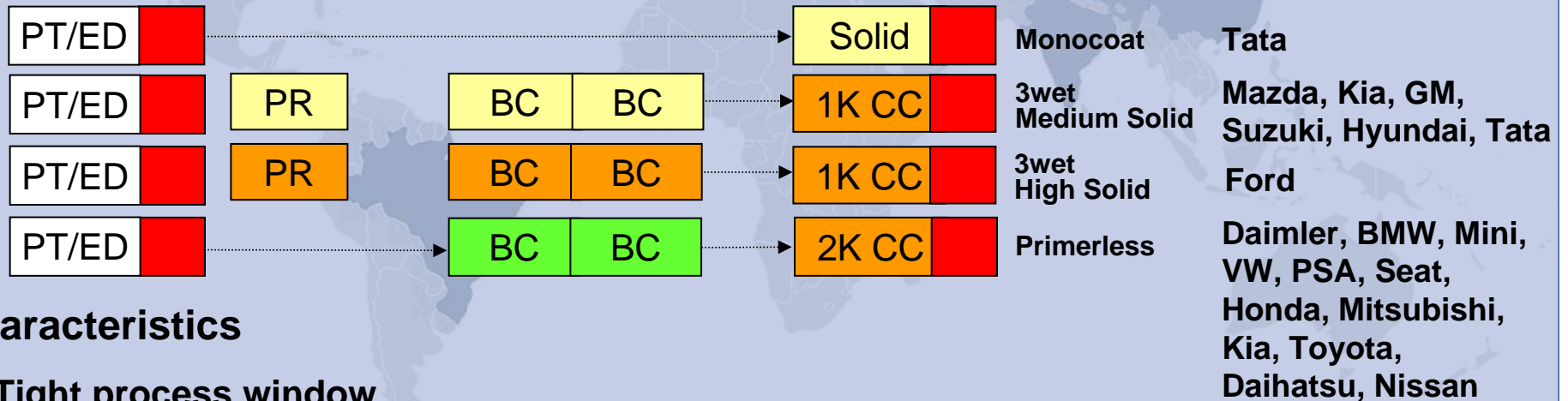


# Standard/Lean Paint Processes

## Standard



## Lean



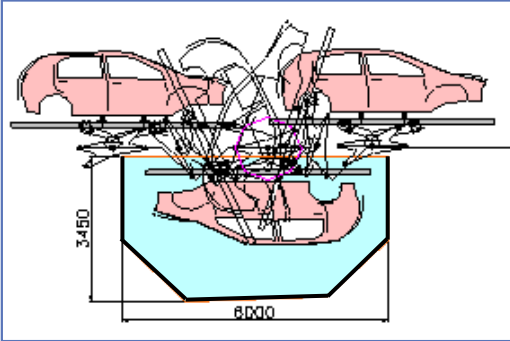
## Characteristics

- Tight process window
- Operation on limit
- Demand for automation

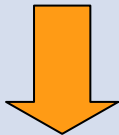
# Cost Effective Solutions (Process)

PT/ED

## Ecopaint RoDip Rotation Dipping

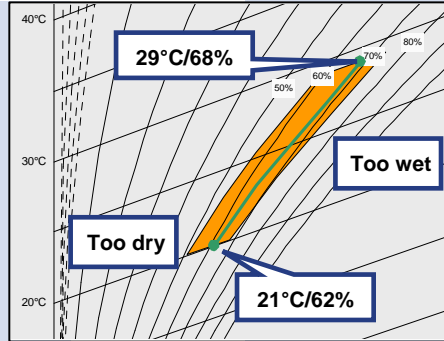


- Space reduction
- Less energy
- High quality



**CPU savings:  
approx. 5 %**

## Temp. & humidity control for max. process window

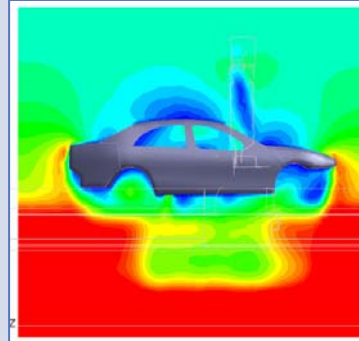


- Less Energy
- High Quality (constant paint evaporation)

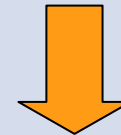


**CPU savings:  
approx. 2 %**

## Optimized Downdraft in Spray Booth

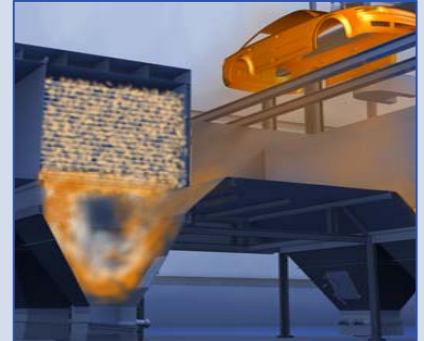


- Downdraft reduction by 10 to 20%
- Less Energy
- Higher TE

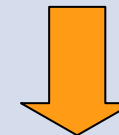


**CPU savings:  
approx. 2 %**

## EcoDryScrubber



- Space reduction
- Reduced air supply system
- Less energy

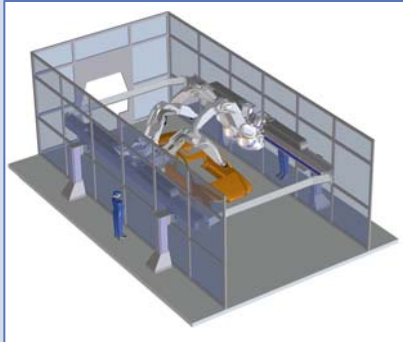


**CPU savings:  
approx. 3 %**

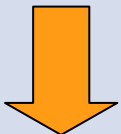
# Cost Effective Solutions (Paint Application)



## Exterior Painting Elevated Robots *EcoRP E*

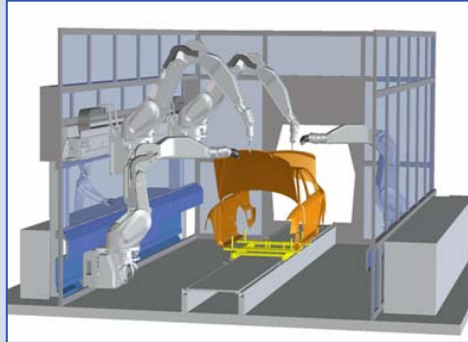


- Reduced footprint
- Less energy for ventilation

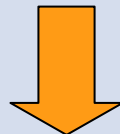


**CPU savings:  
approx. 2 %**

## Interior Painting *EcoRP E/L* Dual Rail System

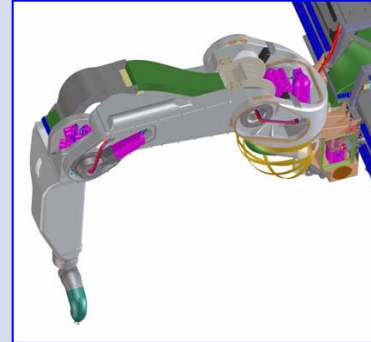


- Reduced footprint
- Less energy for ventilation
- Full degrade mode possible



**CPU savings:  
approx. 2 %**

## System Modularity Low Complexity

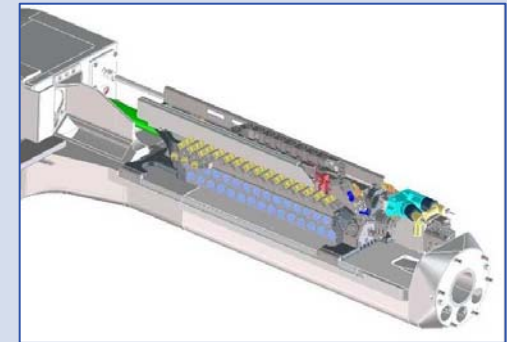


- Simplified maintenance
- High Uptime



**CPU savings:  
approx. 3 %**

## Linear Colour Changer *EcoLCC*



- Low colour change loss (< 10 ml)
- For exterior and interior painting
- Simple technique



**CPU savings:  
approx. 2 %**

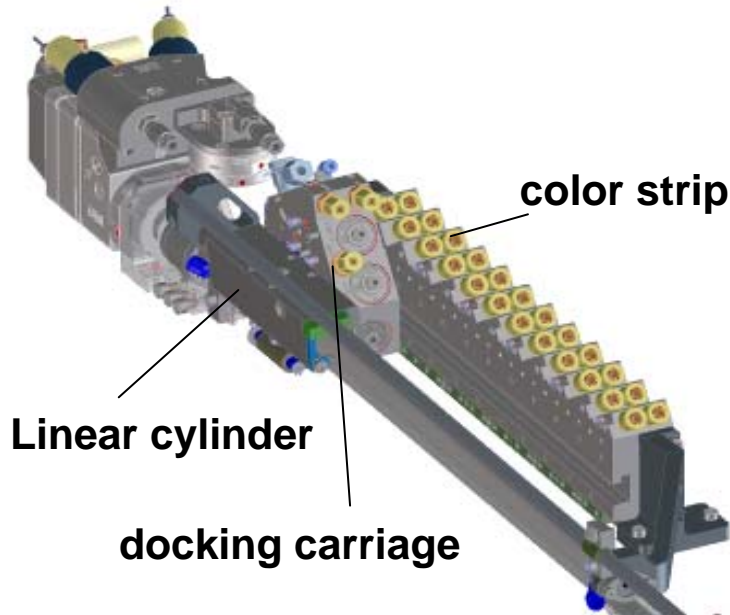
# Cost Effective Solutions (Paint Application)



Ext  
Ele

## EcoLCC - Linear Color Changer

- Color changer without main paint duct
- No paint carryover possible
- Suited for exterior and interior painting



- Color loss less than 10ml
- Color change time < 10s
- Simple technique

CPU savings:  
approx. 2 %

CPU savings:  
approx. 2 %

CPU savings:  
approx. 3 %

CPU savings:  
approx. 2 %

Basis: complete paintshop; figures exemplary

# Cost Effective Solutions (Paint Application)



Atomizer with Integrated Colour Changer  
*EcoBell2 ICC*



- Very low colour change loss (2 ml)
- Short colour change time (6 s)



**CPU savings:  
approx. 3 %**

Bell/Bell Application  
*EcoBell2 M*



- High increase of TE (typical 35 %)
- Reduction of cleaning expenditure

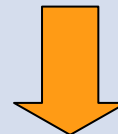


**CPU savings:  
approx. 2 %**

Atomizer for Interior and Bumper Painting  
*EcoBell2 HD*

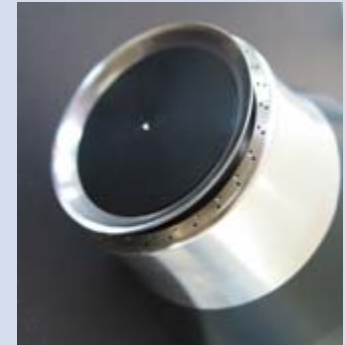


- High increase of TE (typical 15 – 25 %)
- Reduction of cleaning expenditure

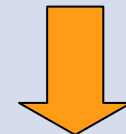


**CPU savings:  
approx. 2 %**

High Performance Flexible Bell  
*EcoBell2 HX*



- For exterior and interior painting with same Bell
- Full degrade functionality



**CPU savings:  
approx. 3 %**

# Cost Effective Solutions (Paint Application)



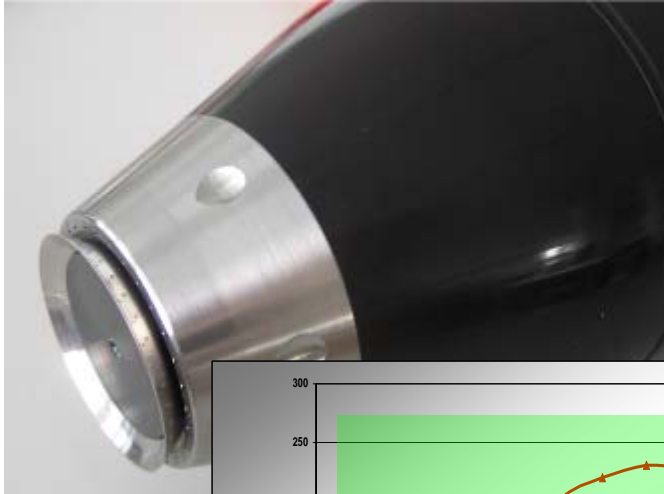
Atomizer with Integrated  
Colour Change  
EcoBell2

Bell/Bell Application

Atomizer for Interior and

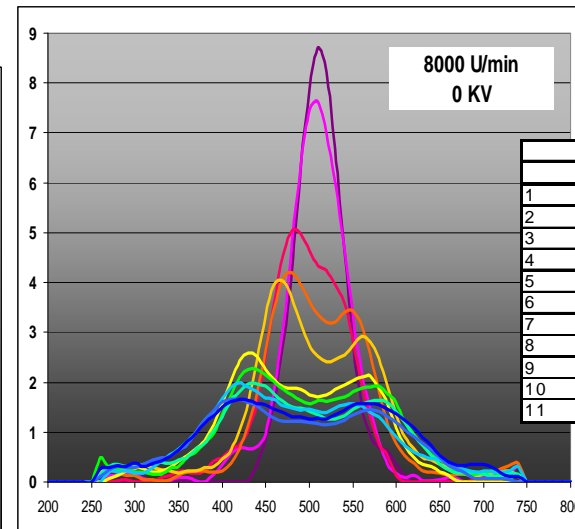
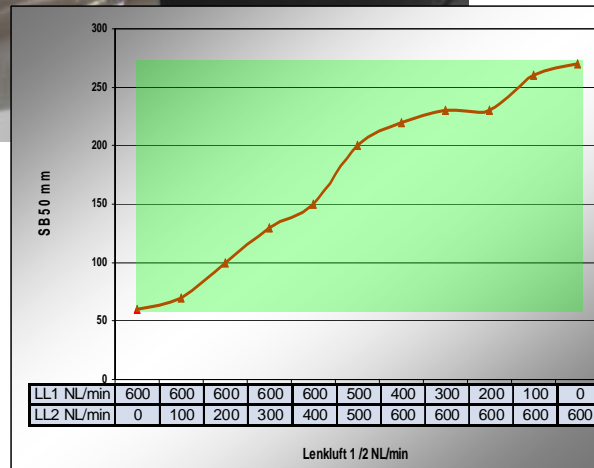
High Performance

## EcoBell2 HX - High Performance Flexible Bell



- Different applications with one Bell: exterior, interior, bumper
- Enables flexible zone sectioning and degrade mode

- Very changeable (2 ml)
- Short changeover



|    | LL1    | LL2    | SB50 |
|----|--------|--------|------|
|    | NL/min | NL/min | mm   |
| 1  | 600    | 0      | 60   |
| 2  | 600    | 100    | 70   |
| 3  | 600    | 200    | 100  |
| 4  | 600    | 300    | 130  |
| 5  | 600    | 400    | 150  |
| 6  | 500    | 500    | 200  |
| 7  | 400    | 600    | 220  |
| 8  | 300    | 600    | 230  |
| 9  | 200    | 600    | 230  |
| 10 | 100    | 600    | 260  |
| 11 | 0      | 600    | 270  |

CPU savings:  
approx. 3 %

CPU savings:  
approx. 2 %

CPU savings:  
approx. 2 %

CPU savings:  
approx. 3 %

Basis: complete paintshop; figures exemplary

# Automobile Painting in Latin America

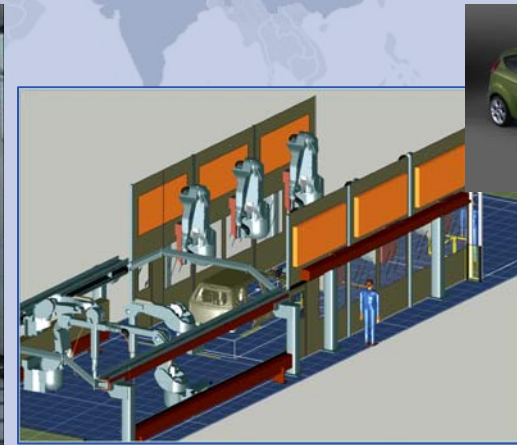
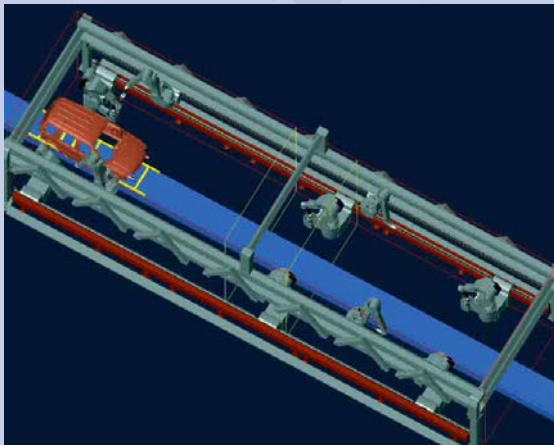


## Ford Cautitlan, Mexico



### Project Highlights

- 3wet high solid process (*EcoBell2 HX*)
- Elevated robots for exteriors, dual rail solution for interiors
- Full degrade mode for exteriors and interiors (lights out paintshop)



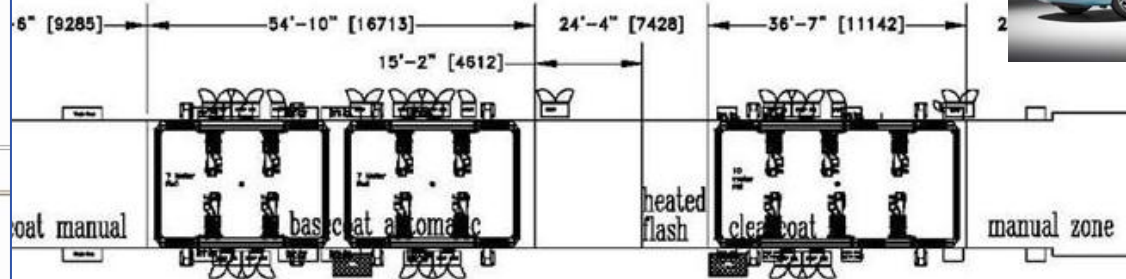
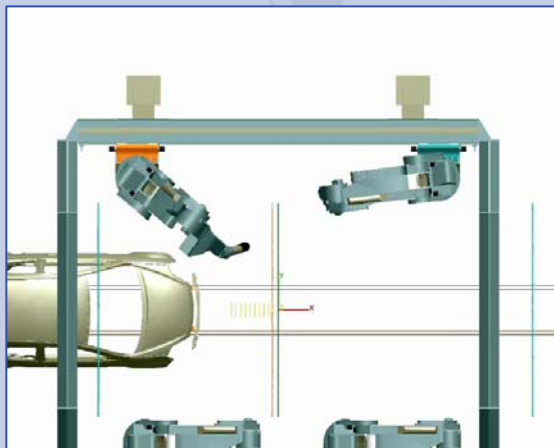
# Automobile Painting in BRIC Countries

## Ford São Bernardo do Campo, Brazil



### Project Highlights

- Elevated robots for exterior and interior application in the same zone/with the same robot
- Bell/Bell for BC1/BC2 (*EcoBell2 M*)



# Automobile Painting in BRIC Countries

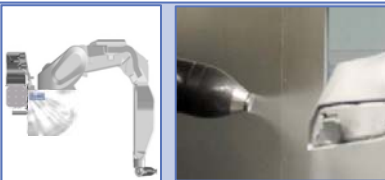
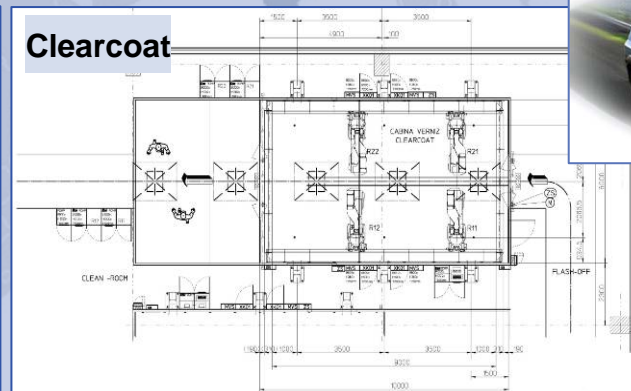
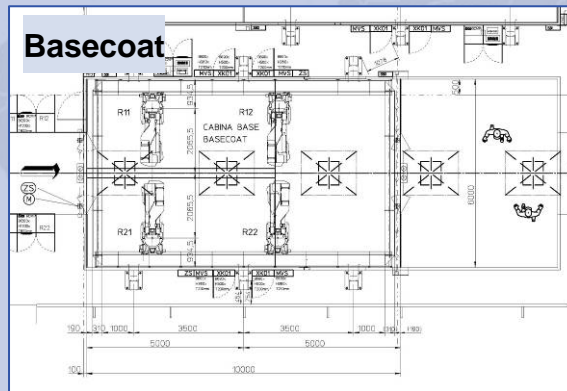
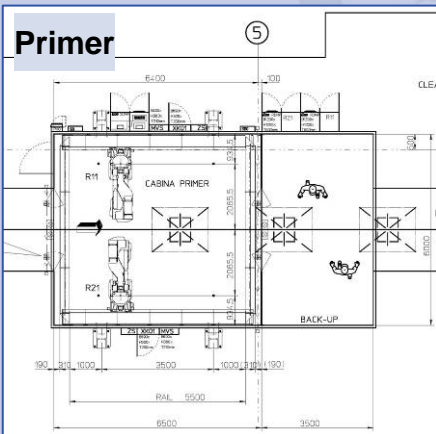


## CAOA Anapolis, Brazil



### Project Highlights

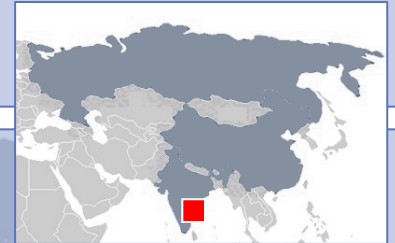
- Elevated robots for bumper application
- Bell application with *EcoBell2 HD* for high TE
- Reduced complexity





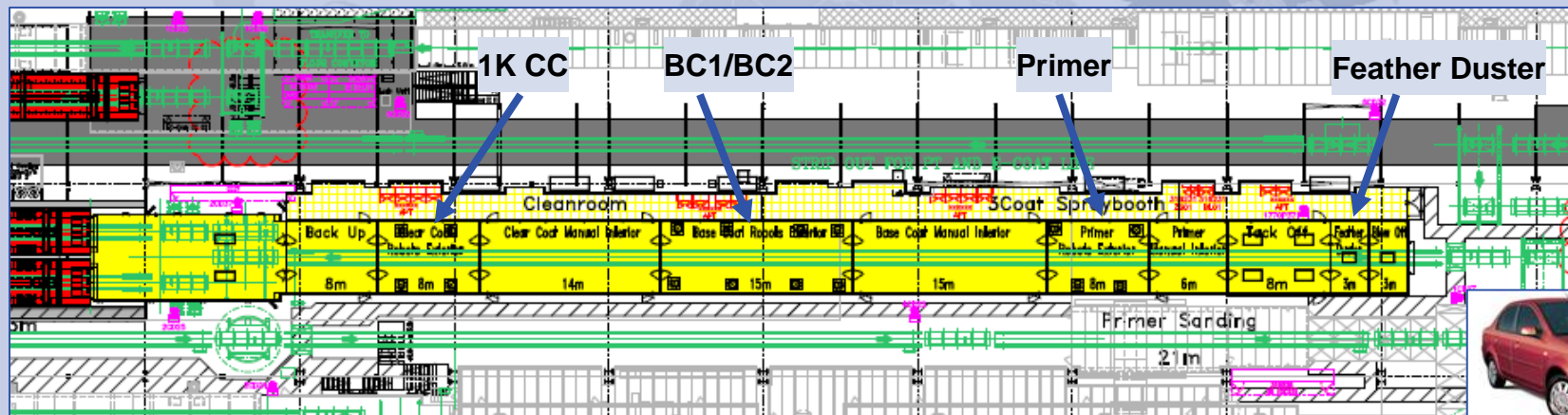
# Automobile Painting in BRIC Countries

## Ford Chennai, India



### Project Highlights

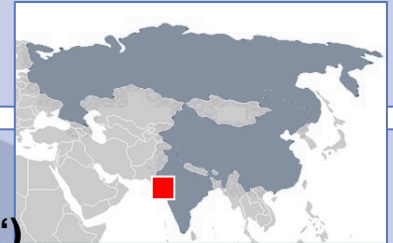
- Lean Process (High solid 3wet)
- Robot application for Exteriors
- Bell/Bell application for BC1/BC2 (*EcoBell2 M*)



# Automobile Painting in BRIC Countries

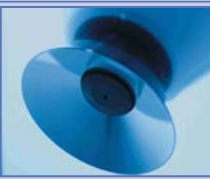
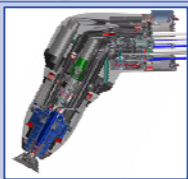
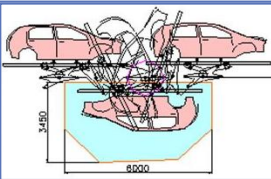
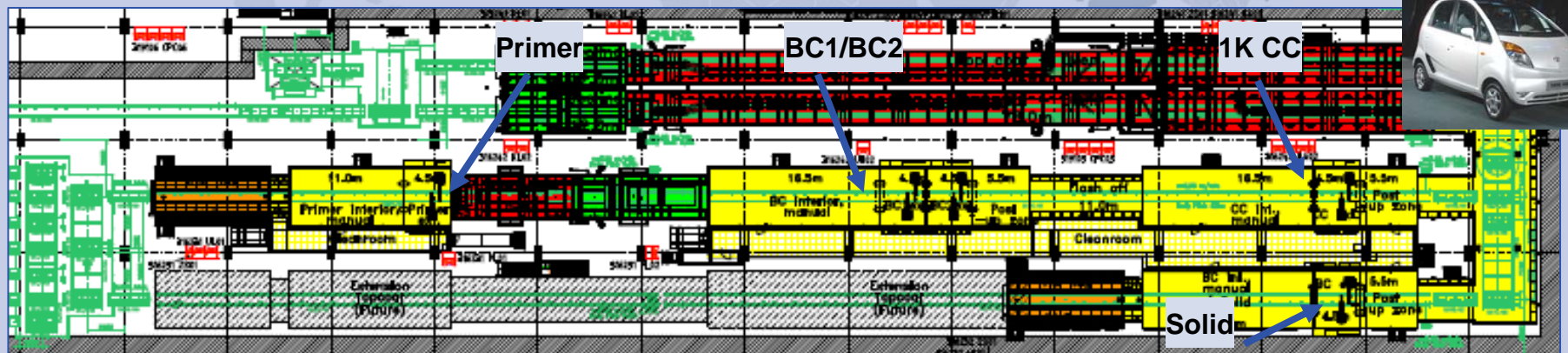


## Tata Sanand, India



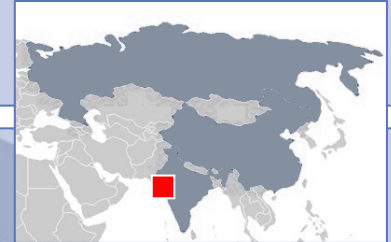
### Project Highlights

- 2-Line-Concept (3wet Line for „Nano luxury“, Monocoat Line for „Nano standard“)
- *Ecopaint* RoDip for pretreatment and E-Coat, Robot application for exterior areas
- Bell/Bell application for BC1/BC2 with *EcoBell2* ICC



# Automobile Painting in BRIC Countries

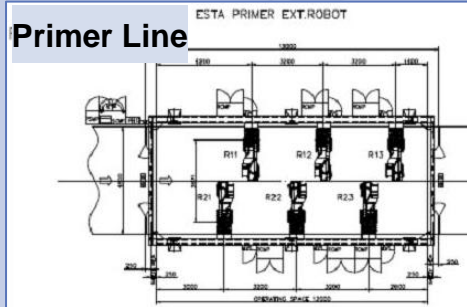
## Mahindra Chakan, India



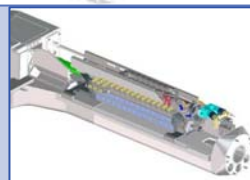
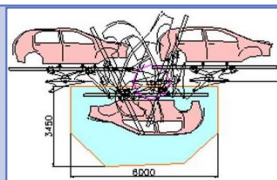
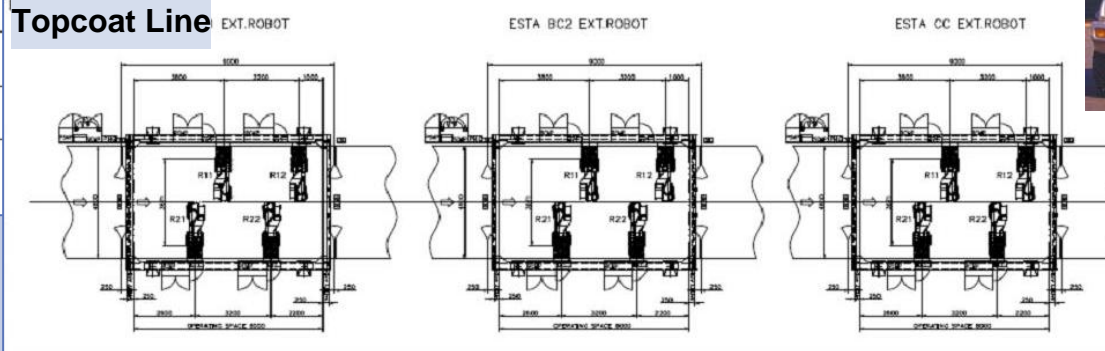
### Project Highlights

- **Ecopaint** RoDip for pretreatment and E-Coat
- Elevated robots for exterior application
- Bell/Bell application for BC1/BC2 with **EcoLCC** colour changer and **EcoBell2** ICC for Primer and CC/Solid

### Primer Line

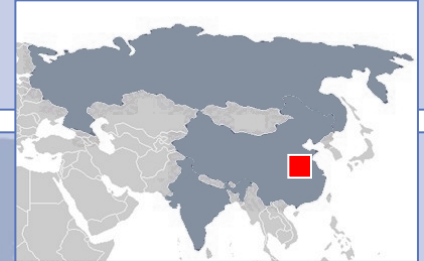


### Topcoat Line



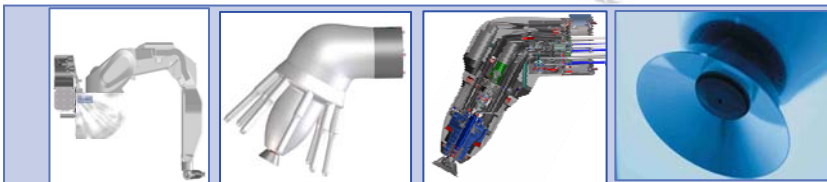
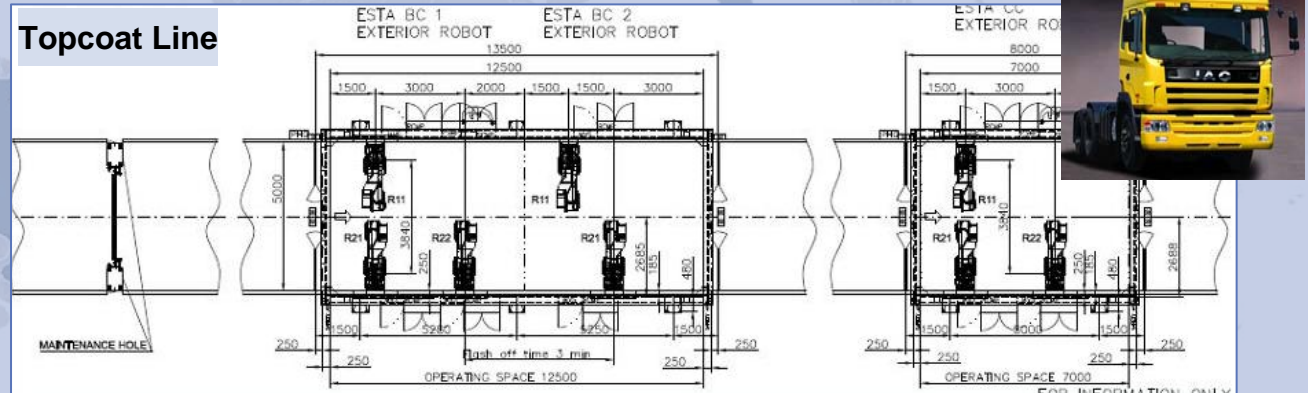
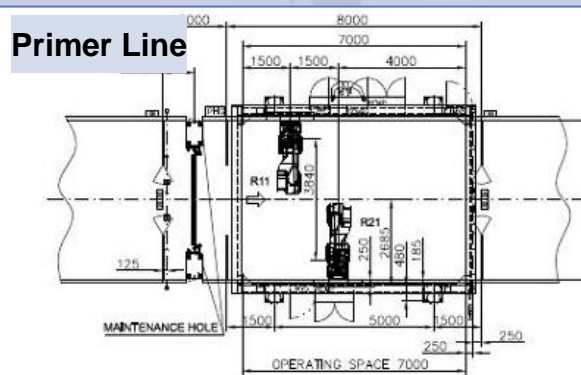
# Automobile Painting in BRIC Countries

## JiangHuai Automobile Co., Hefei, China



### Project Highlights

- Elevated robots for exterior application
- Bell/Bell for BC1/BC2, (waterborne, indirect charge)
- *EcoBell2* ICC for Primer (waterborne, indirect charge) CC/Solid (solventborne, direct charge)



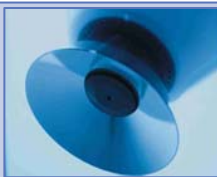
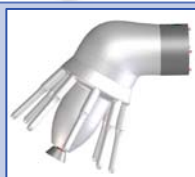
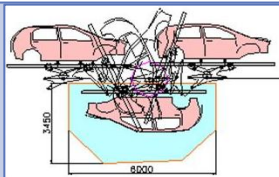
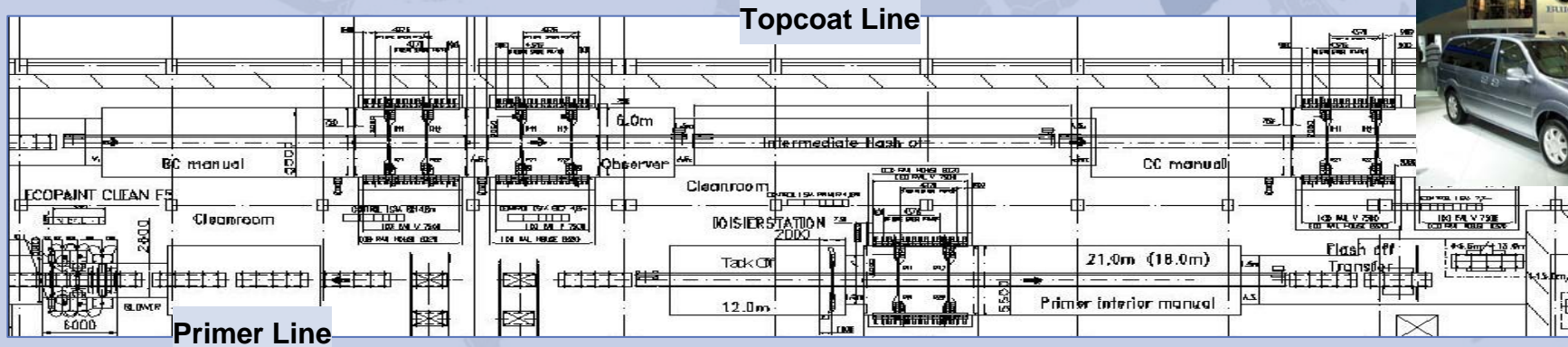
# Automobile Painting in BRIC Countries

## SGM Norsom, Shenyang, China



### Project Highlights

- *Ecopaint* RoDip for Pretreatment and E-Coat
- Robots for exterior application
- Bell/Bell for BC1/BC2 (waterborne, indirect charge)



# Automobile Painting in Europe

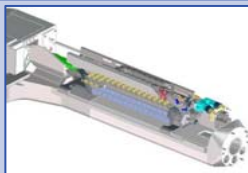
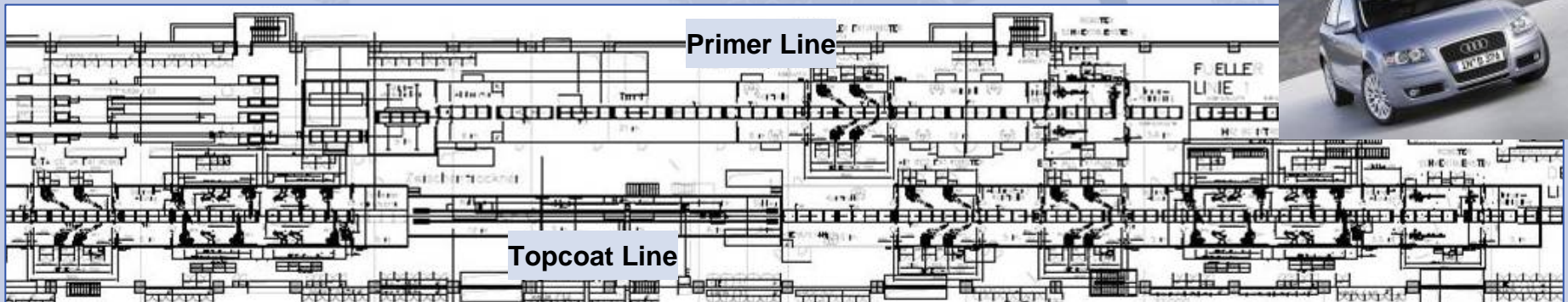


## Audi, Brussels, Belgium



### Project Highlights

- Robots for exterior and interior application
- **EcoBell2 HD** for interior application (waterborne paint, no charge)
- **EcoLCC** colour changer



# Summary and Perspective

- ✓ **BRIC and established markets are getting more and more equal**
- ✓ **Quality differentiation rather by painting processes, not by paint equipment**
- ✓ **Automation makes new lean paint processes more stable**
- ✓ **Quality at low costs necessary and possible for all markets and enabled by simple and most efficient paint equipment**

**Thank you for Attention  
Questions ?**

