



**CHRYSLER**

# Product Development

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Chrysler Group LLC 2010-14 Business Plan

November 4, 2009

**DODGE**

**Jeep**

**CHRYSLER**

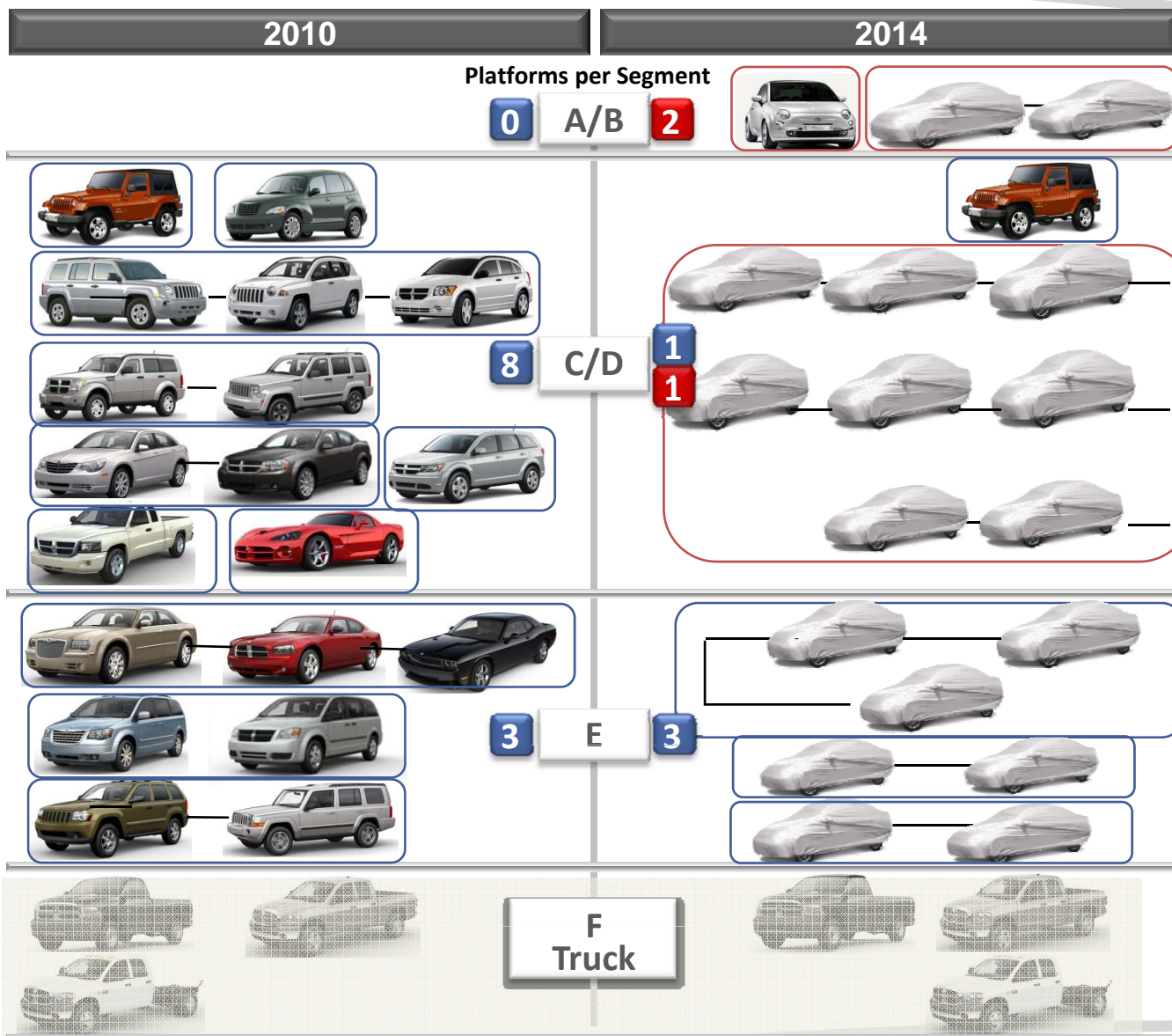


## Product development priorities



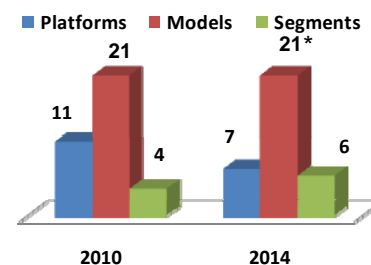
- 1 Align organization to Fiat Group for maximization of communication
- 2 Align resources to support Chrysler's 5-year business plan
- 3 Maximize use of common platforms, systems, and components through sharing with Fiat Group and expansion of Chrysler usage profile
- 4 Maximize fuel economy by reducing vehicle weight and optimizing aerodynamics
- 5 Deliver technologies to meet demanding customer expectations in fuel economy, infotainment and connectivity
- 6 Enhance speed to market using Fiat Group timing benchmarks, virtual tools, and component commonization
- 7 Implement advanced powertrain systems across vehicle platforms

# Reaching additional segments through platform sharing with Fiat Group



## Highlights:

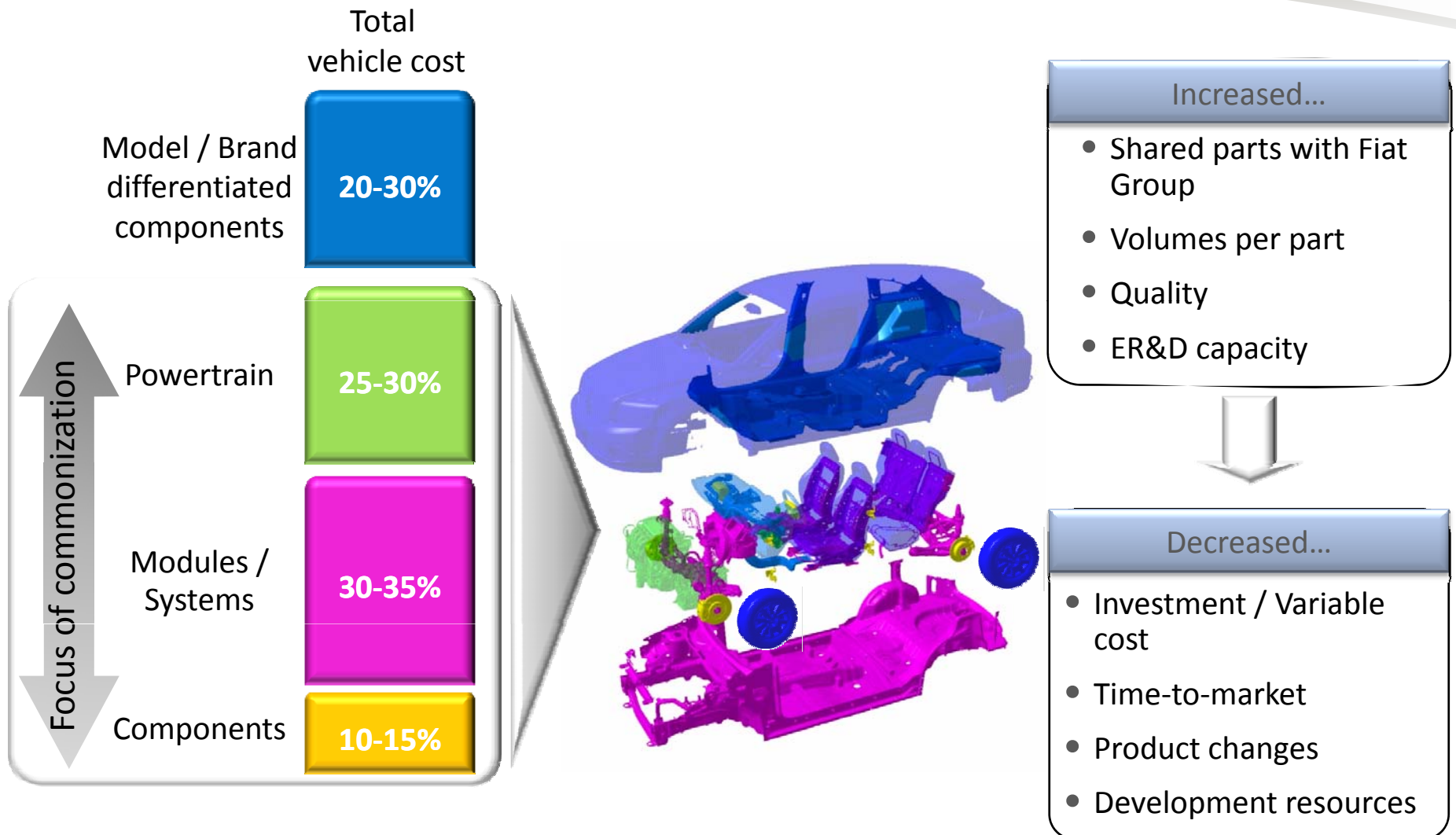
- Future car models (21)\*
- New segments enabled by Fiat (2)
- Shared platforms with Fiat (3)
- Platforms consolidated (4)
- Development efficiency improves as resources focused on fewer, high volume platforms



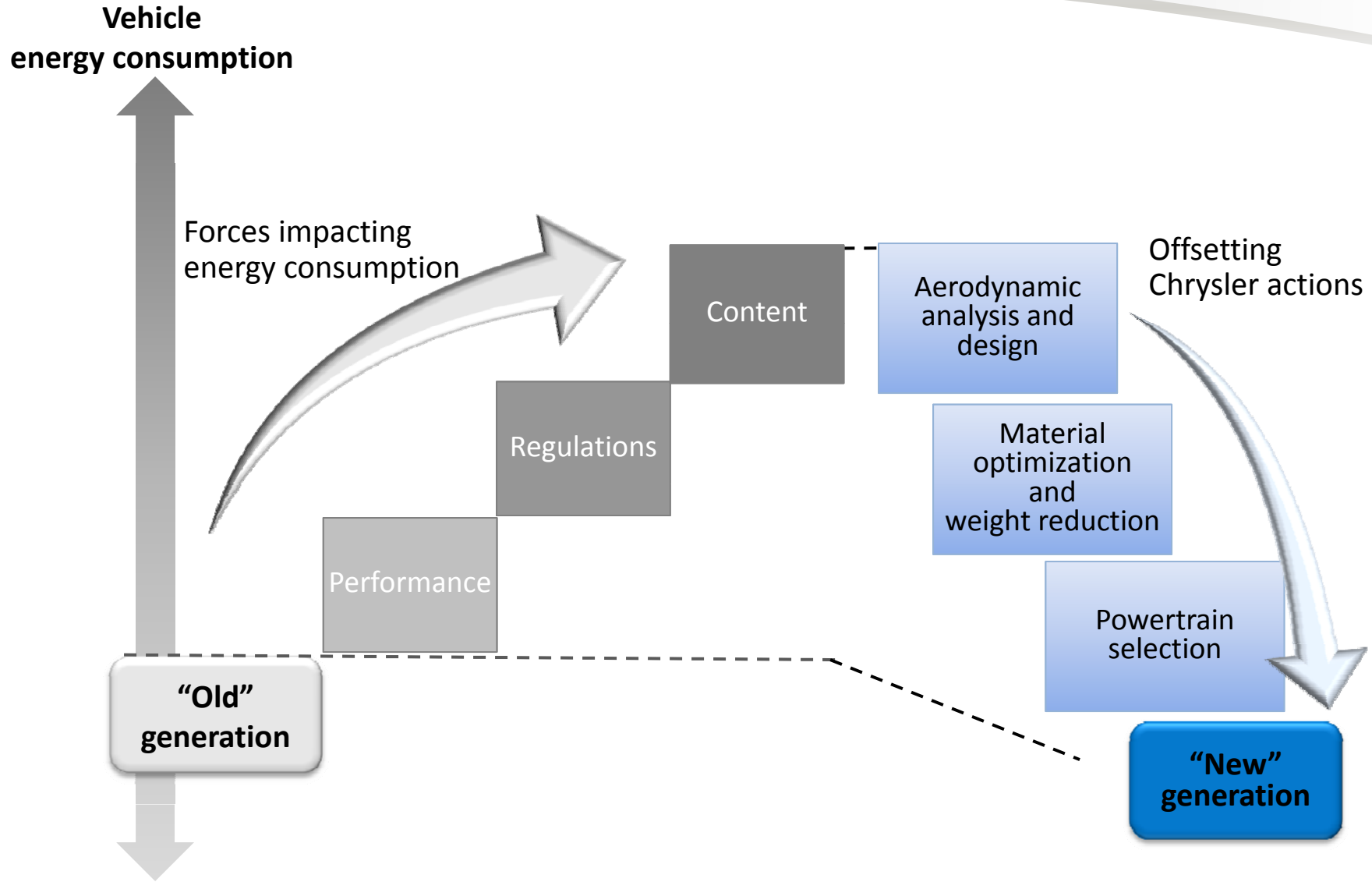
Year	Average models per platform	Average volume per platform
2010	1.9	125,000
2014	3.0	305,000
Change	58%	144%

\*Count includes Chrysler engineered models excluding full size trucks

## Commonization will accelerate through sharing with Fiat Group



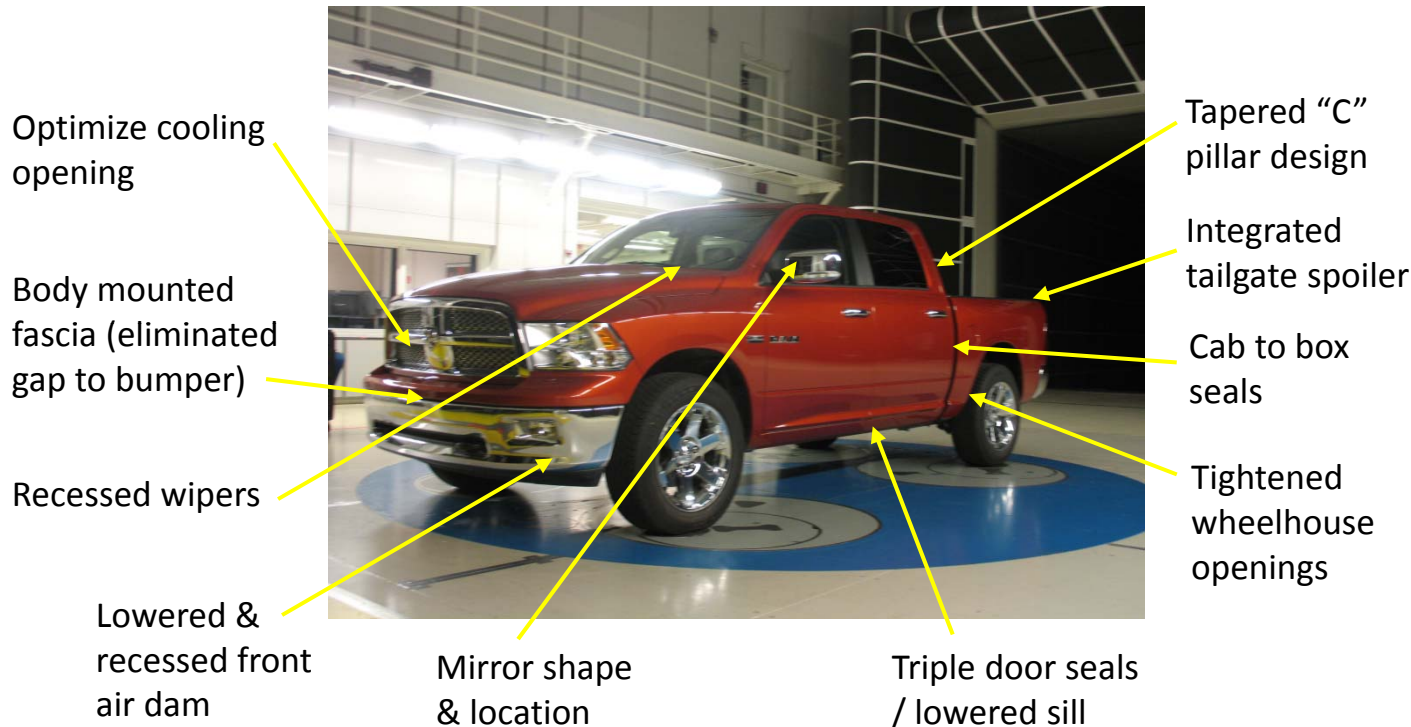
# Vehicle energy demand reduction requires weight savings and aerodynamic improvements



## Vehicle energy demand reduction process: aerodynamic improvements



### Design actions based on aerodynamics 2009 Dodge Ram 1500 4x4 5.7L Crew Cab Pickup



- Rigorous process to deliver best-in-class aerodynamic performance
- On-site world class wind tunnel is a strong enabler
- 11% improvement in Ram aerodynamics delivered 5% increase in fuel economy

#### Competitive comparison

Vehicle	Cd	CdA
<b>Dodge Ram 1500 Crew Cab - Short Box</b>	<b>0.414</b>	<b>15.2</b>
GM Silverado Crew Cab - Short Box	0.435	15.3
Ford F-150 Supercrew - Short Box	0.425	16.0

**Result: best-in-class  
aerodynamics**

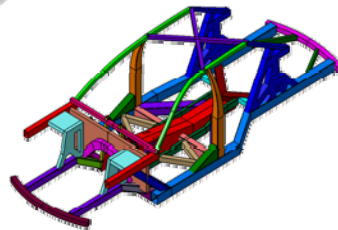
## Vehicle energy demand reduction process: weight reduction



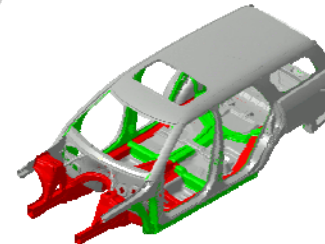
### Use proprietary, automated computer technology to optimize structure



**Packaging volume**  
Holistic forces: safety,  
refinement, durability



**Beam model**  
Load paths



**Optimization**  
Steel gauge and  
solution development

### Implement alternate materials to minimize gauge, eliminate parts, and reduce vehicle weight



**Weight Reduction:**  
• 11 lbs (5.0 kg)  
• 27.5% weight saved

**New design**  
• Advanced HS steels  
combining parts

**Previous design**  
All parts 50ksi  
High Strength Steel

**Ultra High Strength Steel**

**Steel hood**



**Weight Reduction:**  
• 15 lbs (6.8 kg)  
• 45% weight saved



**Aluminum**



**Steel**

**Weight Reduction:**  
• 8 lbs (3.6 kg)  
• 36% weight saved



**Magnesium**

# Optimizing systems across product plan by adding Fiat Group electrical architectures



## Current state

Chrysler EE Architecture Plan	2010	2011	2012	2013	2014
C Segment			???	???	???
D Segment				???	???
E Segment - Cars					
E-Segment - Minivans					
Trucks					

Existing EE Architecture (TIPM)  
 New Powernet Electrical Architecture  
 EE Architecture Solution TBD

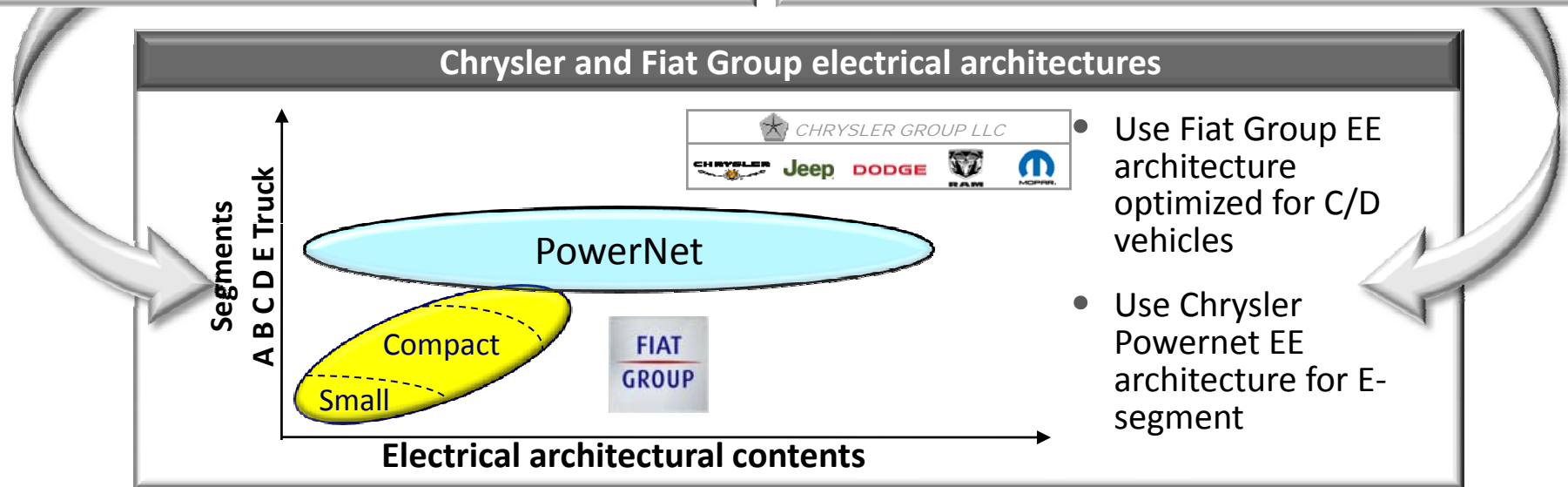
- Powernet developed for E-segment
- C/D Segment solutions not optimal

## Future state

Chrysler EE Architecture Plan	2010	2011	2012	2013	2014
A/B Segment					
C Segment					
D Segment					
E Segment - Cars					
E-Segment - Minivans					
Trucks					

Existing EE Architecture (TIPM)  
 New Powernet Electrical Architecture  
 Fiat Compact Electrical Architecture

- EE architectures are appropriately sized to vehicle segment allowing component and system sharing



## Common electrical architecture enables customer access to advanced features



### Entertained

Feature rich multimedia experience



### Connected & Synchronized

Connected to people, places and things that matter most



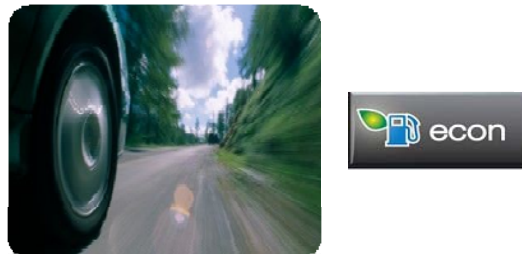
### Secure

Hands on the wheel, eyes on the road



### Environment

Socially responsible, environmentally conscious



### Easy to Own

Affordable, easy to use, intuitive



# UConnect enables seamless integration of mobile devices and services



Hands-free call  
Address sync  
Voice command...



Nav  
Traffic  
POI's  
Geo-fencing  
Deals...



Sirius  
TV  
Music carry-in  
Download...



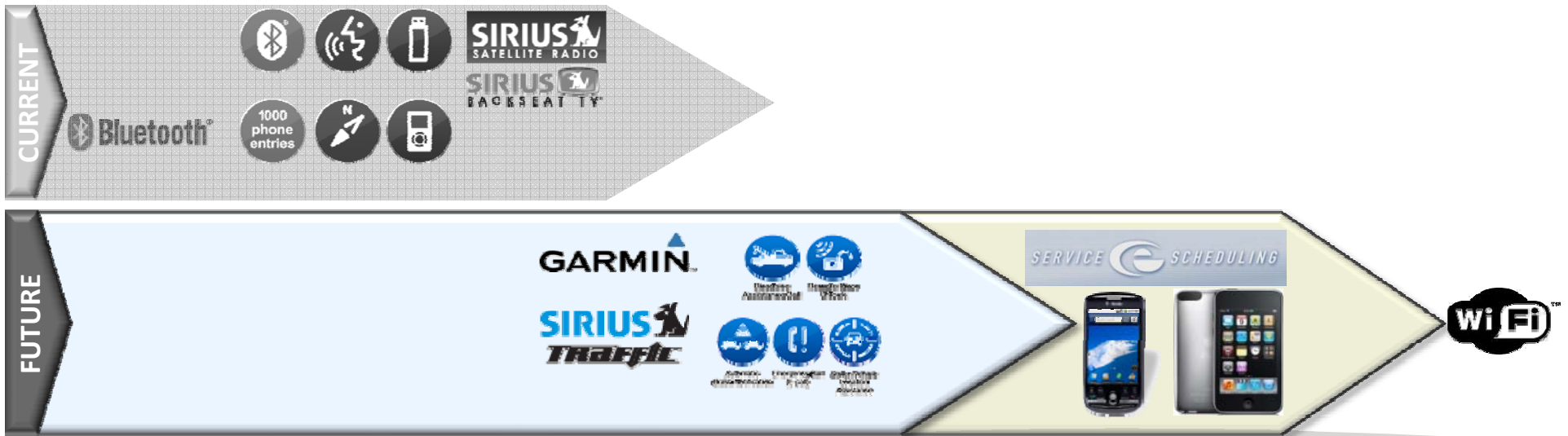
Search  
eMail  
Social  
Calendar  
Files ...



Safety security  
Roadside  
Door lock / Unlock  
Locator  
Tracking  
Geo-fencing ...



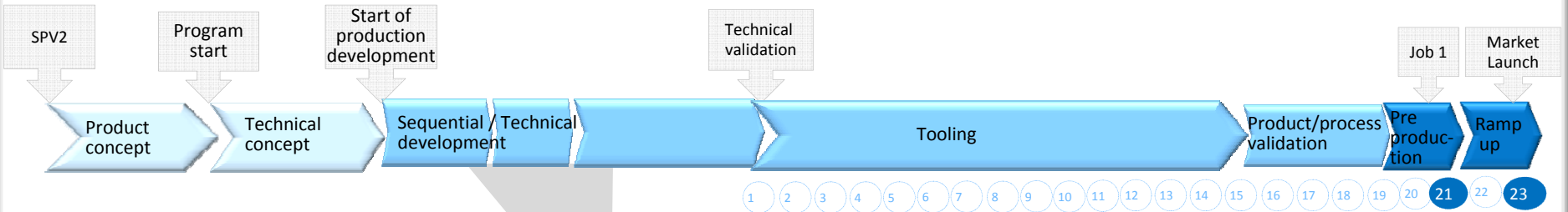
Remote updates  
Remote diagnostic  
Personal settings ...



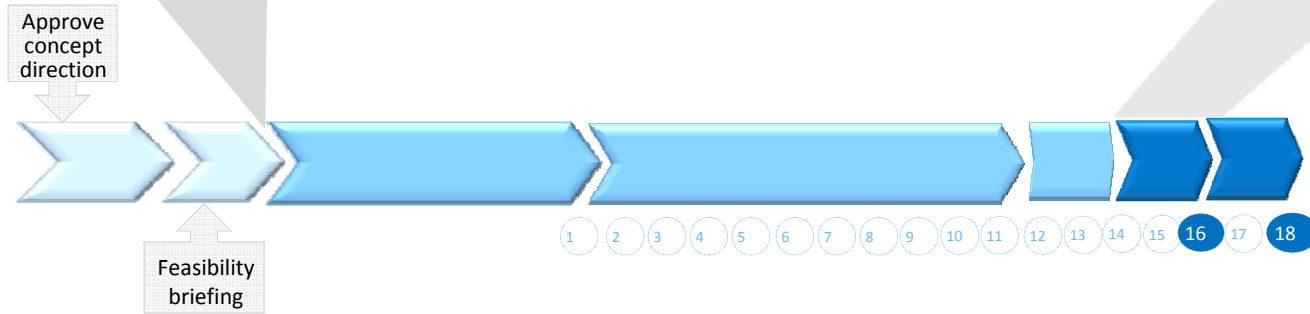
# Shared vehicle architectures and components combined with virtual analysis tools to reduce program lead times



## From months



## To months



**Improving  
speed-to-market time  
by incorporating  
Fiat Group/Chrysler  
best practices...**

### Timing improvements

- Product development phase starts later - allows resources to be allocated to other programs
- Product development phase minimized through parallel vs. sequential activities
- Launch vehicles 5 months sooner. Through use of virtual tools and prototype vehicles, S0 build phase is eliminated

### Key timing enablers

- Enhanced use of virtual tools
- Disciplined design freeze
- Early supplier involvement
- Commonization of components

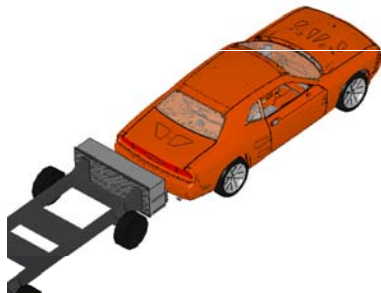
## Execution of our product plan requires expanded use of virtual tools to enhance design efficiency



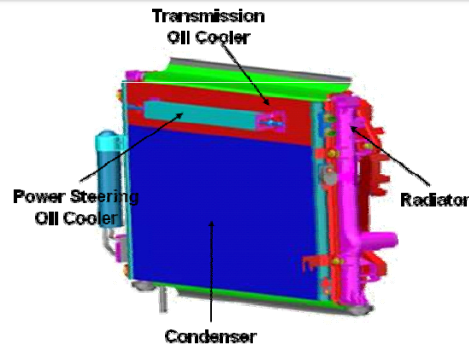
### Virtual tool strategy

- Expand use of virtual tools immediately to meet short term product needs
- Trust results of virtual analysis to eliminate redundant physical builds
- Maximize synergies with Fiat Group capability to achieve state-of-the-art capability on new programs – eliminate fully skinned prototypes
- Implement common world-class approach with new C/D segment

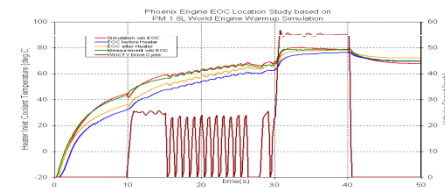
#### Impact simulation



#### Cooling module sizing



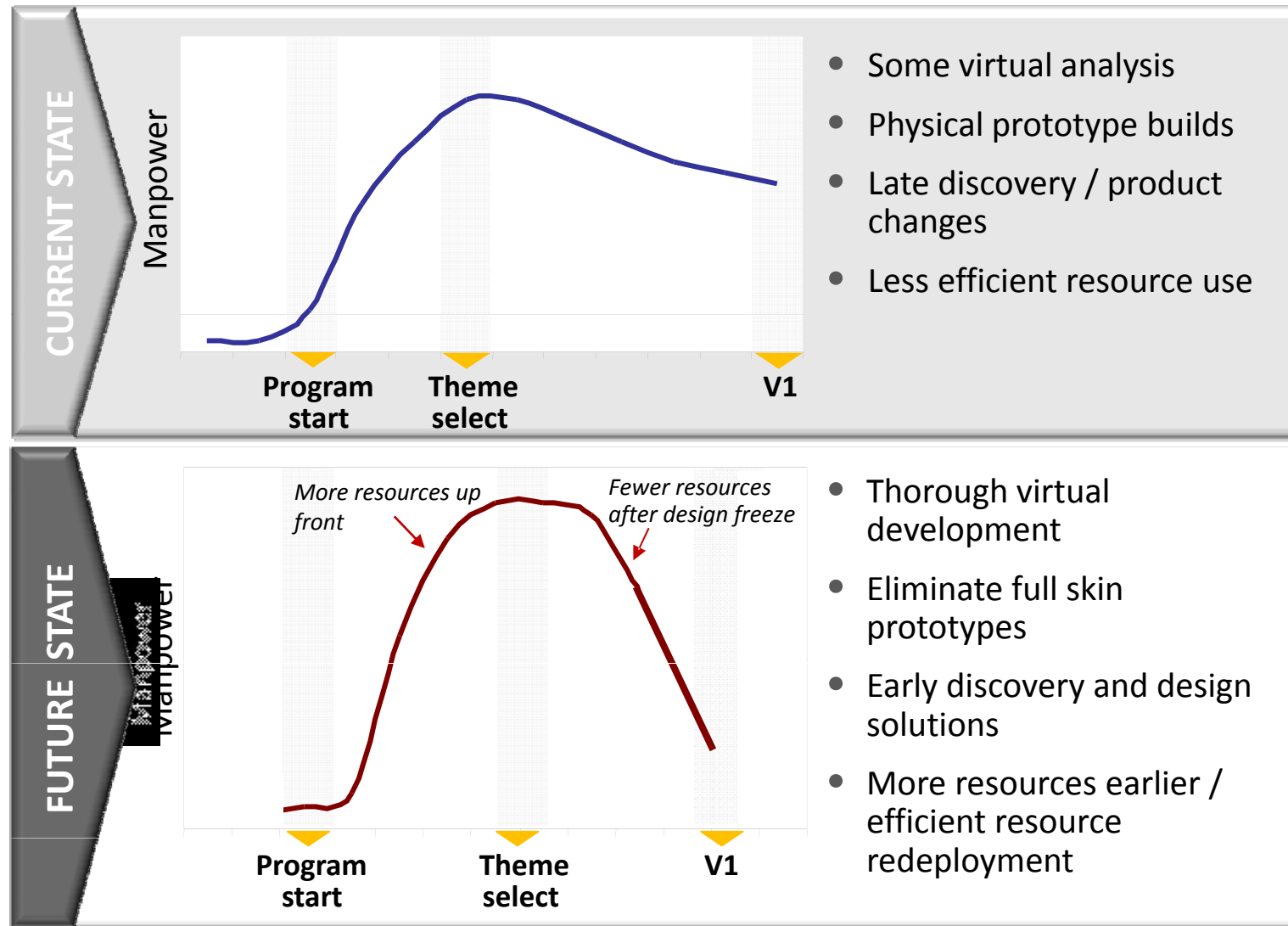
#### Warm-up simulation



Virtual tools improve speed, reduce cost, and improve quality...  
but require a resource shift



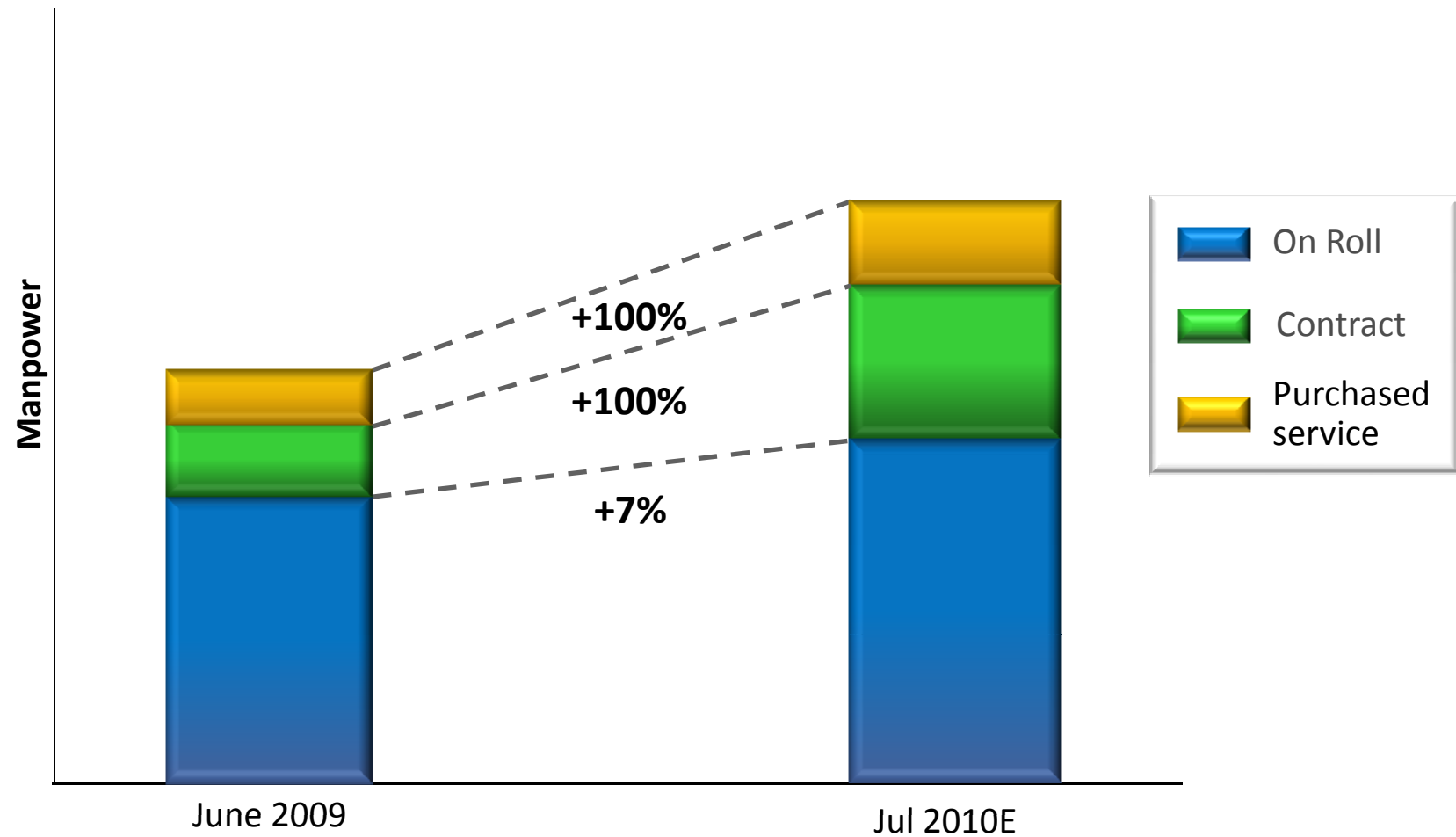
### Program timing



Development needs will be met by flexible resources and selective technical hiring



## Chrysler 2009-2010 Engineering Workforce



*Note: ex powertrain engineering*

## Conclusion



### Chrysler product development

- Aligned to Fiat Group
- Enhanced resources
- Modern architectures
- Reduced complexity
- Increased efficiency
- Expanded technology
- Faster to market

