

Circular Economy and I4.0 structuration process

Carlos Montalvo

TNO – Strategic Analysis and Policy

6 November 2018, Brussels



Key enablers of CE in Manufacturing

THE RTO INNOVATION SUMMIT

Flexible, smart and *resource efficient* manufacturing systems

Clean advanced materials and processes



Energy Efficiency

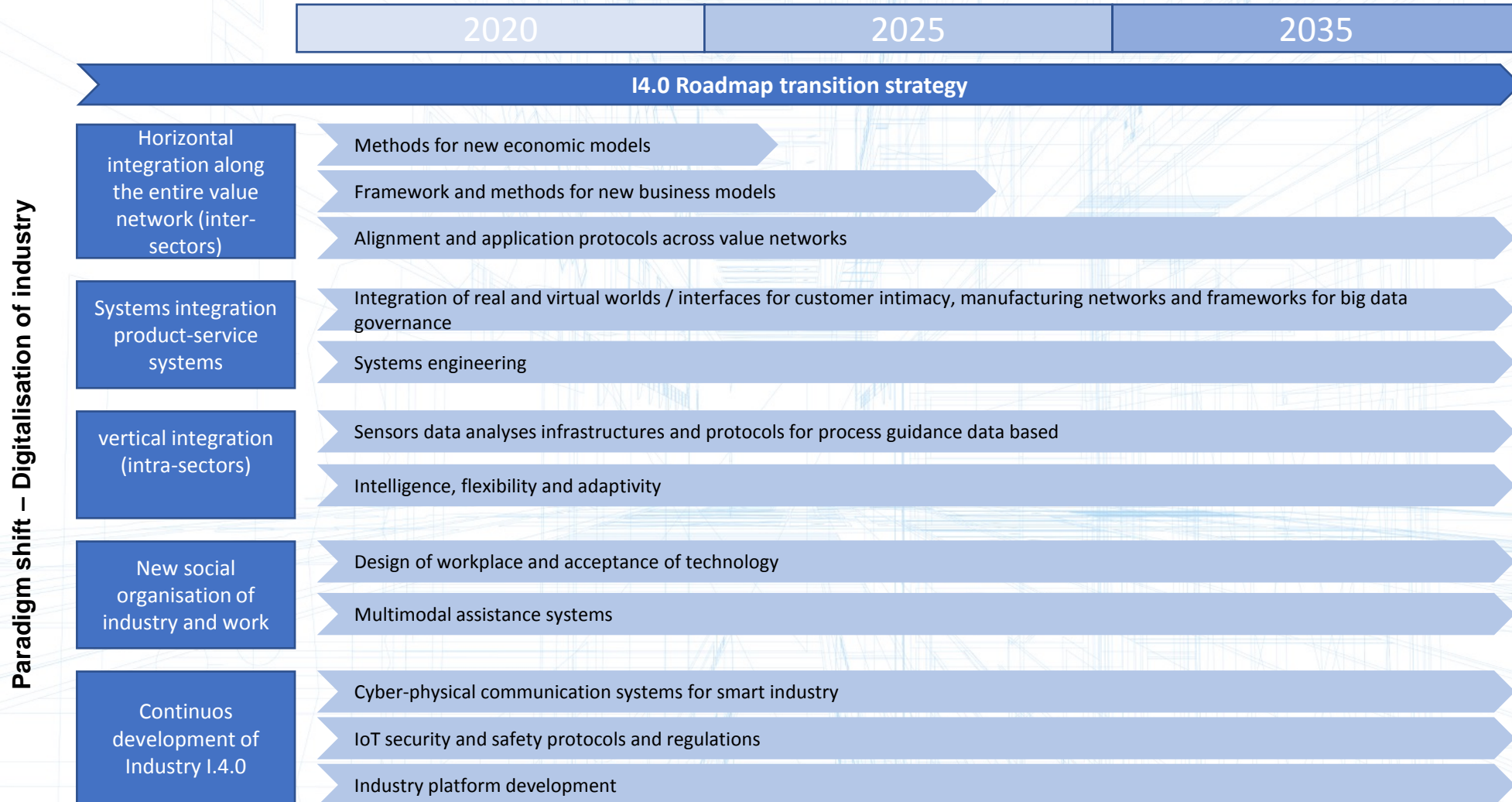


Track and Trace Connected digital factory



Upscaling and structuration scenarios

THE RTO INNOVATION SUMMIT



Industry 4.0 (2014)

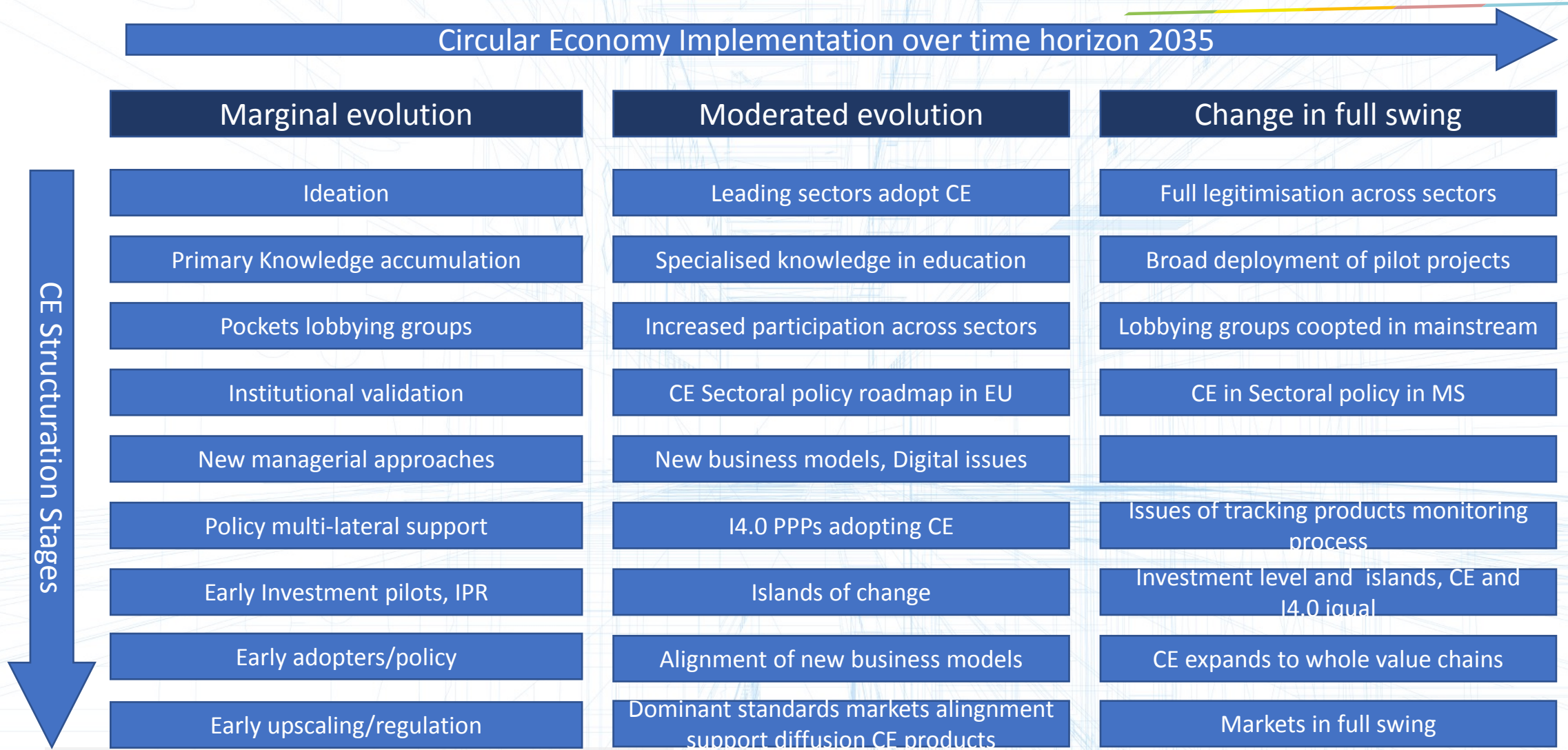


Transitions structuration steps

- a) definition of the societal challenge (Circular economy implementation);
- b) development and accumulation of a critical mass across different type of actors that recognize the issue as important and is willing to generate visions and contribute to the solution;
- c) appearance of lobbying groups (pro and against) and increased public debate;
- d) emergence of institutions advocating, hosting and proposing approaches to address the issue;
- e) adoption of the issue in the policy agenda by government and multilateral organizations;
- f) development of technical and managerial approaches to address the issue;
- g) investment flows to develop and test solutions while patenting and IPRs are settled;
- h) early adoption sprout niche markets supported by policy instruments (e.g., taxes and subsidies), regulation and standards start to consolidate markets;
- i) investments for production up-scaling often backed by sectoral policy and regulation and wider diffusion takes place;
- j) mass markets growth, competition and distribution of production locations become issues for industrial policy.

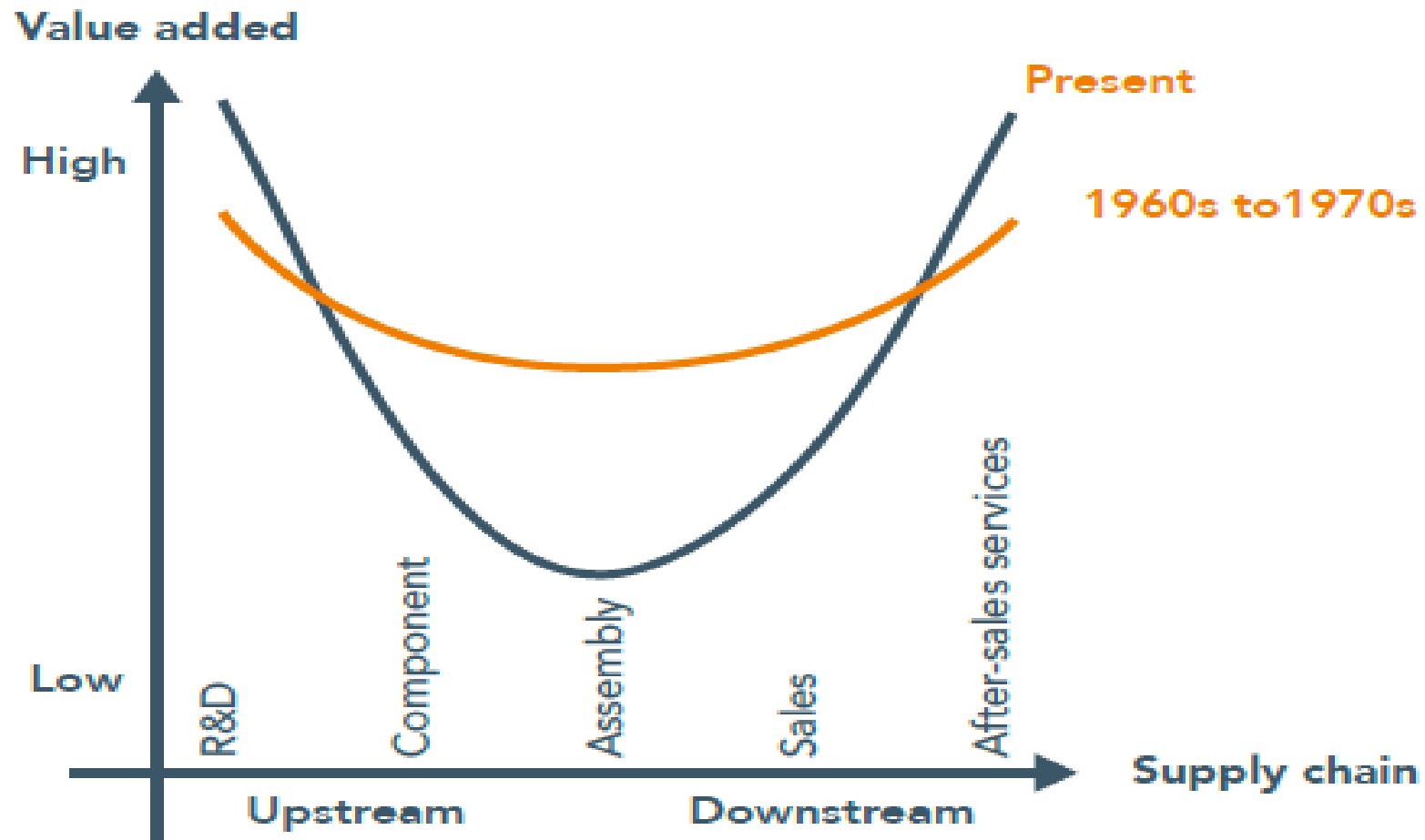
Upscaling and structuration scenarios

THE RTO INNOVATION SUMMIT



Competitive pressure on manufacturing

THE RTO INNOVATION SUMMIT



Stan Shin smile curve

