



Non-Road Mobile Machinery

New Regulation (EU) 2016/1268

repealing Directive 97/68/EC

IVR Workshop
Würzburg, 1 June 2017

European Commission
DG GROW C.4 – Automotive and Mobility Industries
DG MOVE D.3 – Ports and Inland Navigation
P. Troppmann, M. Wolska



European
Commission

General introduction



Regulation (EU) 2016/1628 OF THE EP AND OF THE COUNCIL of 14 September 2016

on requirements relating to gaseous and particulate
pollutant emission limits and type-approval for internal
combustion engines for non-road mobile machinery (NRMM)

- *It's about*
 - **Engines** – *not vehicles, machinery or vessels!*
 - **Pollutant emissions** – *gaseous (CO, NO_x, HC) & particulate (PM)!*
 - **Emission limits & type-approval procedures** – *for new engines!*
- *Scope of application is wide!*

New NRMM proposal



New scope of application

European Commission

Land-based NRMM

NRS, NRSh

SI - Spark-ignited (gasoline)

SI 0-19kW

SI 19-56kW



56-130kW

130-560kW

>560kW

Gen-Sets >560kW



CI 0-8kW

CI 8-19kW

CI 19-37kW

CI 37-56kW

CI - Compression-ignited (diesel)

NRE

Rail - Locomotives

0-130kW

>130kW



Rail - Railcars

0-130kW

>130kW



Inland Waterway Vessels (IWV)

19-37kW

37-75kW

75-130kW

130-300kW

300-1000kW

≥1000kW

Auxiliaries 19-560kW

Auxiliaries 560-1000kW

Auxiliaries ≥1000kW



Snowmobiles

>0kW



All Terrain & Side-by-Side Vehicles

>0kW



Internal market, Industry, Entrepreneurship and SMEs



Scope of Directive 97/68/EC



Scope extensions new NRMM proposal

Some key features of new NRMM Regulation

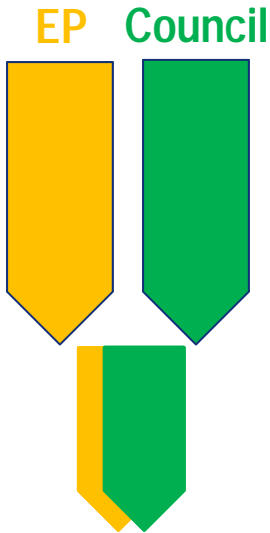
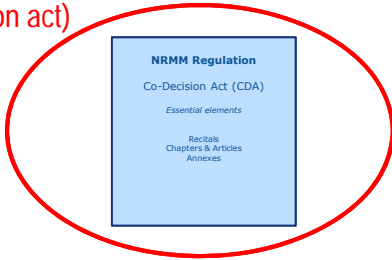


- **Regulation**
- **"Stage V"**
- **Enhanced market-surveillance provisions**
- **Simplification of administrative procedures**
- **Staggered application dates for Stage V**
- **New transition scheme**
- **Use of an EU-wide database for type-approvals**
- **Monitoring of emissions from in-service engines**
- **Type-approval also for gas-fuelled engines (partial/mono)**
- **Eliminating "greyzones"** (field testing, sep. shipment, ATEX,...)
- **Early type-approval for Stage V**

Structure of new NRMM legislation

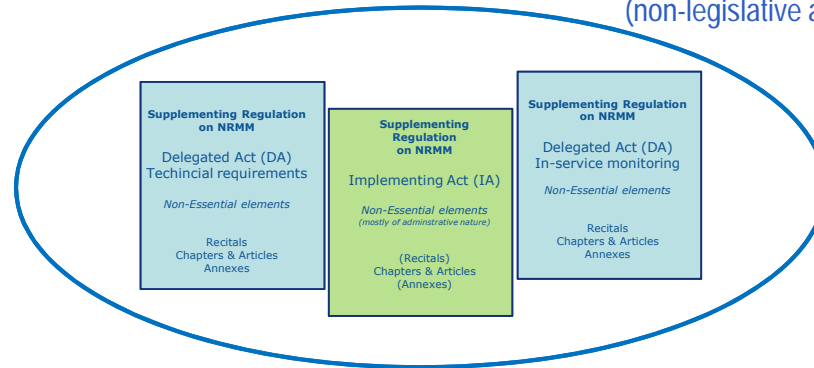


Main legislation
(co-decision act)



REGULATION (EU) 2016/1628
OF THE EP & COUNCIL
on essential requirements

Supplementing legislation
(non-legislative acts)



Commission



DELEGATED REGULATION (EU) 2017/654
on technical and general requirements

IMPLEMENTING REGULATION (EU) 2017/656
on administrative requirements

DELEGATED REGULATION (EU) 2017/655
on monitoring of gaseous pollutant emissions
from in-service engines

Internal market,
Industry,
Entrepreneurship
and SMEs

Land-based NRMM (CI <56kW & Engines >56kW)



CI 0-8kW CI 8-19kW CI 19-37kW CI 37-56kW

56-130kW

130-560kW

>560kW

Gen-Sets >560kW

 Scope of Directive 97/68/EC
 Additional in new NRMM proposal



CI engines < 56kW & Engines >56kW		Directive 97/68					New NRMM proposal						
		Stage	CO	NOx	HC	PM	PN	CO	NOx	HC	PM	PN	A
emissions in g/kWh													
CI engines 0 - 8 kW	variable & constant	-	-	-	-	-	-	8	7,5	0,4/0,6	-	1,1	
CI engines 8 - 19 kW	variable & constant	-	-	-	-	-	-	6,6	7,5	0,4	-	1,1	
CI engines 19 - 37 kW	variable & constant	IIIA	5,5	7,5	0,6	-	-	5,0	4,7	0,015	1x10 ⁻¹²	1,1	
CI engines 37 - 56 kW	variable	IIIB	5,0	4,7	0,025	-	-	5,0	4,7	0,015	1x10 ⁻¹²	1,1	
	constant	IIIA	5,0	4,7	0,4	-	-	5,0	4,7	0,015	1x10 ⁻¹²	1,1	
Engines 56 - 130 kW	variable	IV	5,0	0,4	0,19	0,025	-	5,0	0,4	0,19	0,015	1x10 ⁻¹²	1,1
Engines 56-75 kW	constant	IIIA	5,0	4,7	0,4	-	-	5,0	0,4	0,19	0,015	1x10 ⁻¹²	1,1
Engines 75 - 130 kW			5,0	4,0	0,3	-	-	5,0	0,4	0,19	0,015	1x10 ⁻¹²	1,1
Engines 130 - 560 kW	variable	IV	3,5	0,4	0,19	0,025	-	3,5	0,4	0,19	0,015	1x10 ⁻¹²	1,1
	constant	IIIA	3,5	4,0	0,2	-	-	3,5	0,4	0,19	0,015	1x10 ⁻¹²	1,1
Engines P > 560 kW	variable & constant - Gen-Sets	-	-	-	-	-	-	3,5	0,67	0,19	0,035	-	6,0
	variable & constant - others	-	-	-	-	-	-	3,5	3,5	0,19	0,045	-	

Internal market,
Industry,
Entrepreneurship
and SMEs

 Limit values in line with US legislation

 Limit values more stringent than US legislation

Inland Waterway Vessels



Inland Waterway Vessels (IWW)



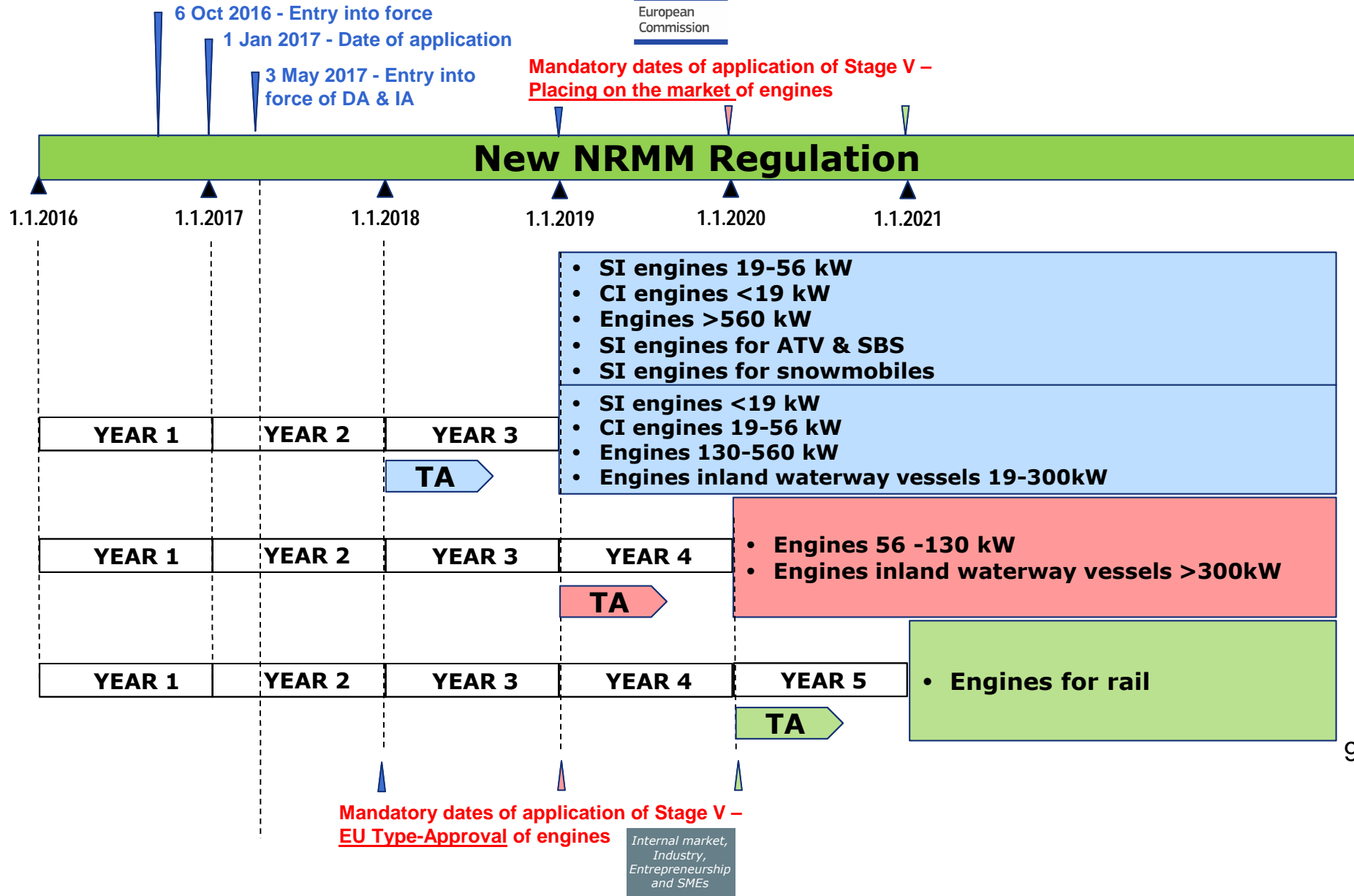
[Under Dir 97/68, auxiliary engines <560 kW for IWW were regulated as engines in land-based NRMM]

- Scope of Directive 97/68/EC
- Additional in new NRMM proposal

Engines for IWW emissions in g/kWh		Directive 97/68						IWP, IWA engines emissions in g/kWh	Reg (EU) 2016/1628					
		Stage	CO	NOx	HC	PM	PN		CO	NOx	HC	PM	PN	A
DP < 0,9	CI engines 19 - 37 kW	IIIA	5,5	Σ: 7,5	0,60	-	1)	19-75 kW	5,0	Σ: 4,7	0,3	-	6,0	
	CI engines >37 kW	IIIA	5,0	Σ: 7,5	0,40	-		75-130 kW	5,0	Σ: 5,4	0,14	-	6,0	
DP 0,9 - 1,2		IIIA	5,0	Σ: 7,2	0,30	-		130-300 kW	3,5	2,1	1,00	0,1	-	6,0
DP 1,2 - 2,5		IIIA	5,0	Σ: 7,2	0,20	-		>300 kW	3,5	1,8	0,19	0,015	1x10 ¹²	6,0
DP 2,5 - 5,0		IIIA	5,0	Σ: 7,2	0,20	-								
DP 5,0 - 15		IIIA	5,0	Σ: 7,8	0,27	-								
DP 15 - 20	CI engines < 3300 kW	IIIA	5,0	Σ: 8,7	0,50	-								
	CI engines > 3300 kW	IIIA	5,0	Σ: 9,8	0,50	-								
DP 20 - 25		IIIA	5,0	Σ: 9,8	0,50	-								
DP 25 - 30		IIIA	5,0	Σ: 11,0	0,50	-								
DP > 30		-	not regulated											

1) regulated as mobile equipment

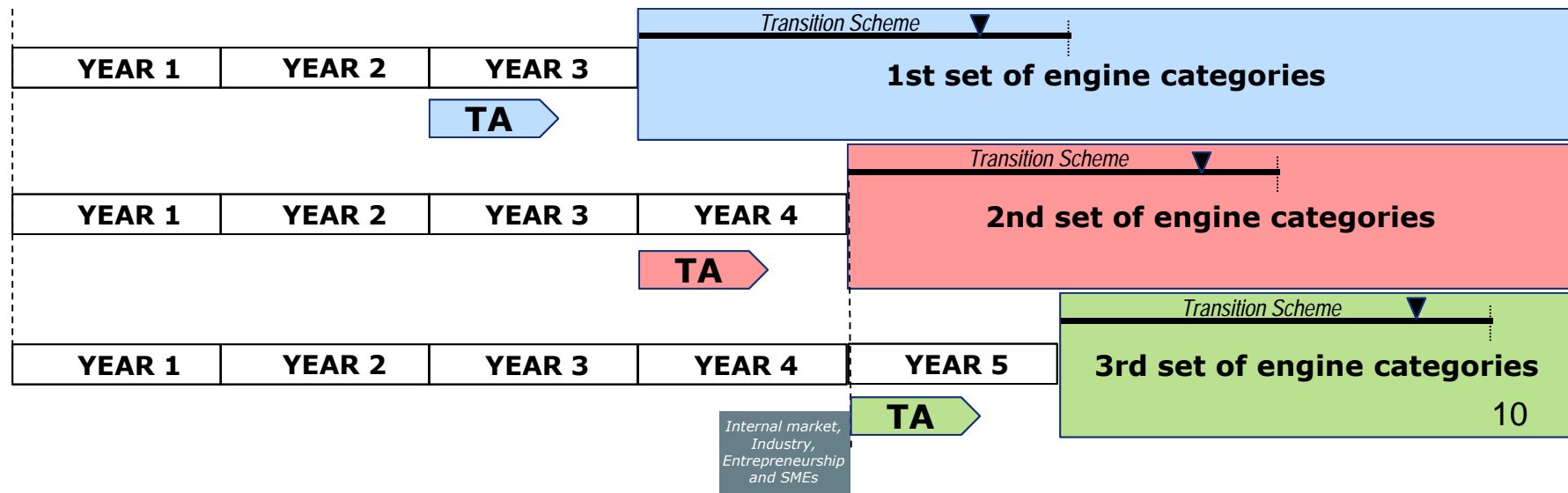
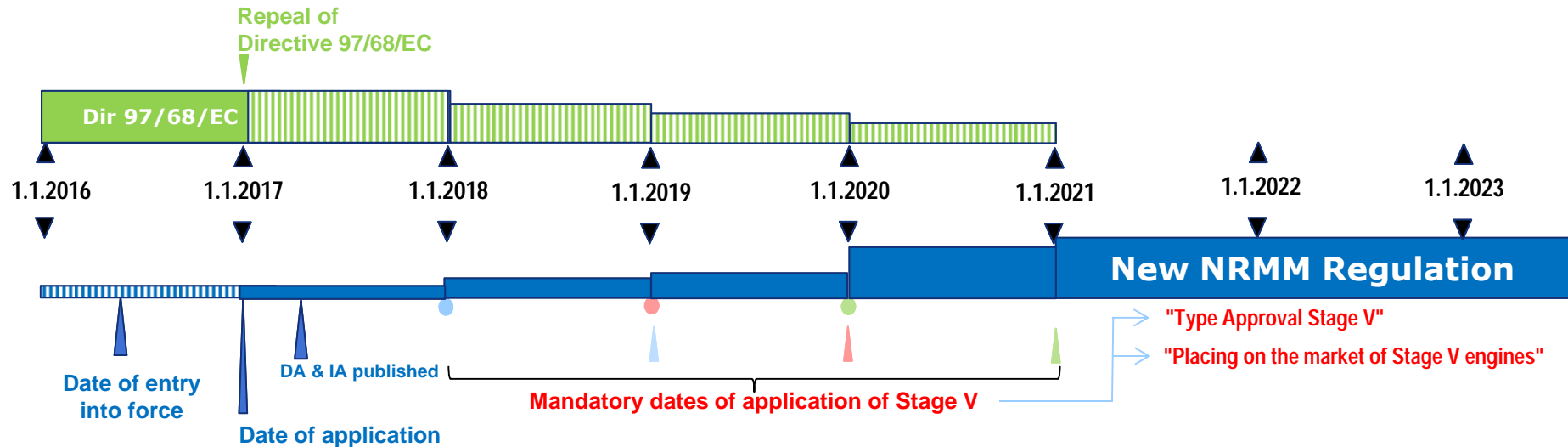
Overall time schedule



Transitional provisions



Art 58



Points of specific interest for the Inland Waterways sector

Provisions that deserve particular attention (1)



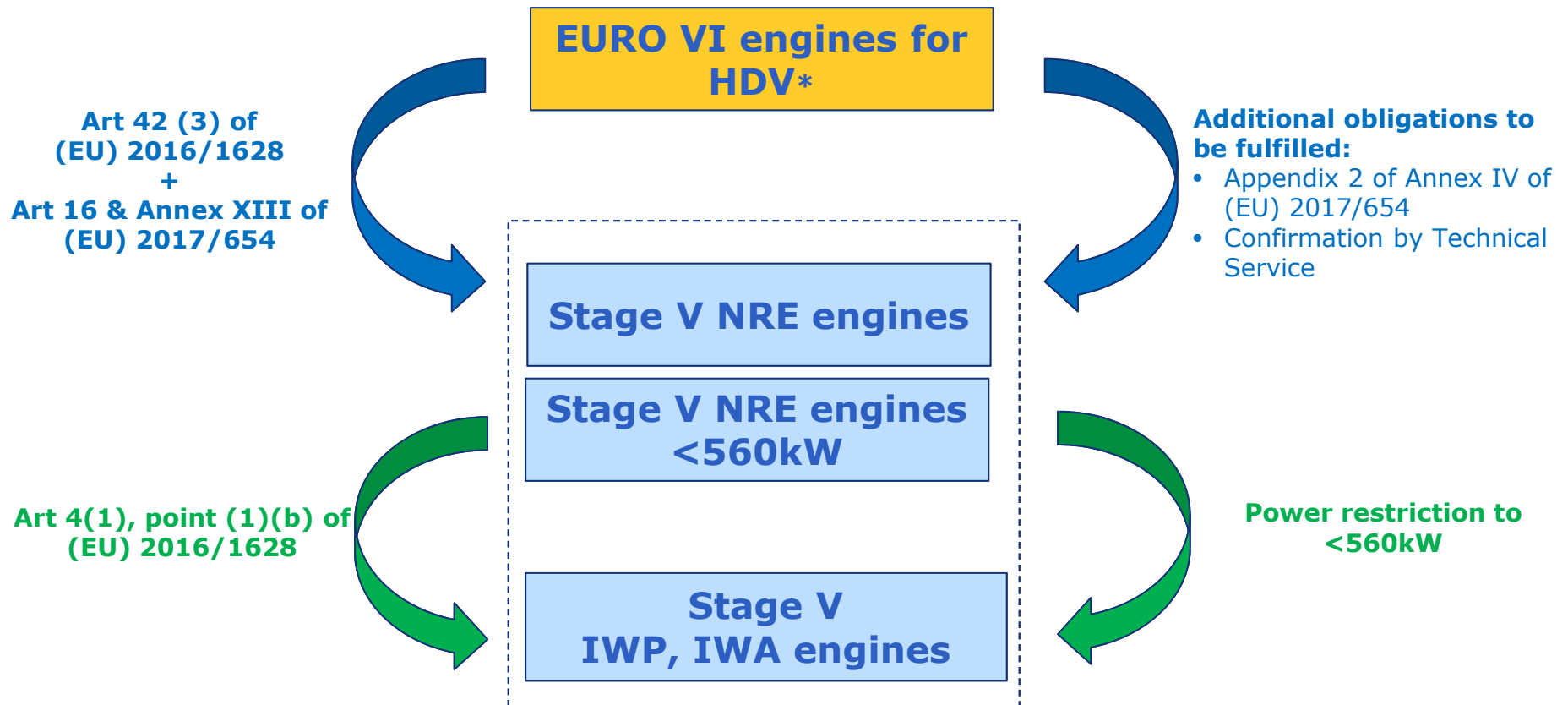
- **Definition of engine categories** (Art 4)
 - (1),point (1)(b): NRE<560kW – alternative use in place of IWP, IWA Stage V engines
 - (1),point (5): IWP - propulsion engines for IWV + alternative use in place of IWA engines
 - (1),point (6): IWA - auxiliary engines for IWV
- **Specific obligations of OEMs on engine installation** (Art 15)
- **Monitoring of emissions of in-service engines** (Art 19)
- **Exemptions** (Art 34)
 - Export engines – only marking, no type-approval
- **Acceptance of equivalent engine type-approvals** (Art 42)
 - UNECE type-approvals, EU type-approvals for road vehicles
- **Transitional provisions on replacement engines** (Art 58)
 - NRE >19kW: Like-for-like, with time limit 20 years as of start of Stage V
 - NRE 19-560kW: in addition, emission stage must not have expired >20 years ago
 - ***NB: No replacement engine provision for IWP & IWA engines!***

Provisions that deserve particular attention (3)



- **Review clauses** (Art 60)
 - **By 31 Dec 2018**
 - **Assessment of possibilities for harmonised measures on retrofitting of emission control devices**
 - **By 31 Dec 2020**
 - **Assessment of further emission reduction potential**
 - **In particular, for IWP/IWA engines:**
 - **more stringent limits for PN – Nox**
 - **more stringent limits for A-factor**
 - **potential addition of PN limits that do not have one set**
 - **By 31 Dec 2025**
 - **Use of exemption clauses & results of monitoring of in-service engines**
 - **Evaluation of TA-tests with regard to real operation conditions**
 - **Feasibility of tests for PM emissions for in-service engine testing**

Use of Euro VI engines for IWT vessels





Thank you

For further information

http://ec.europa.eu/growth/sectors/automotive/environment-protection/non-road-mobile-machinery_en