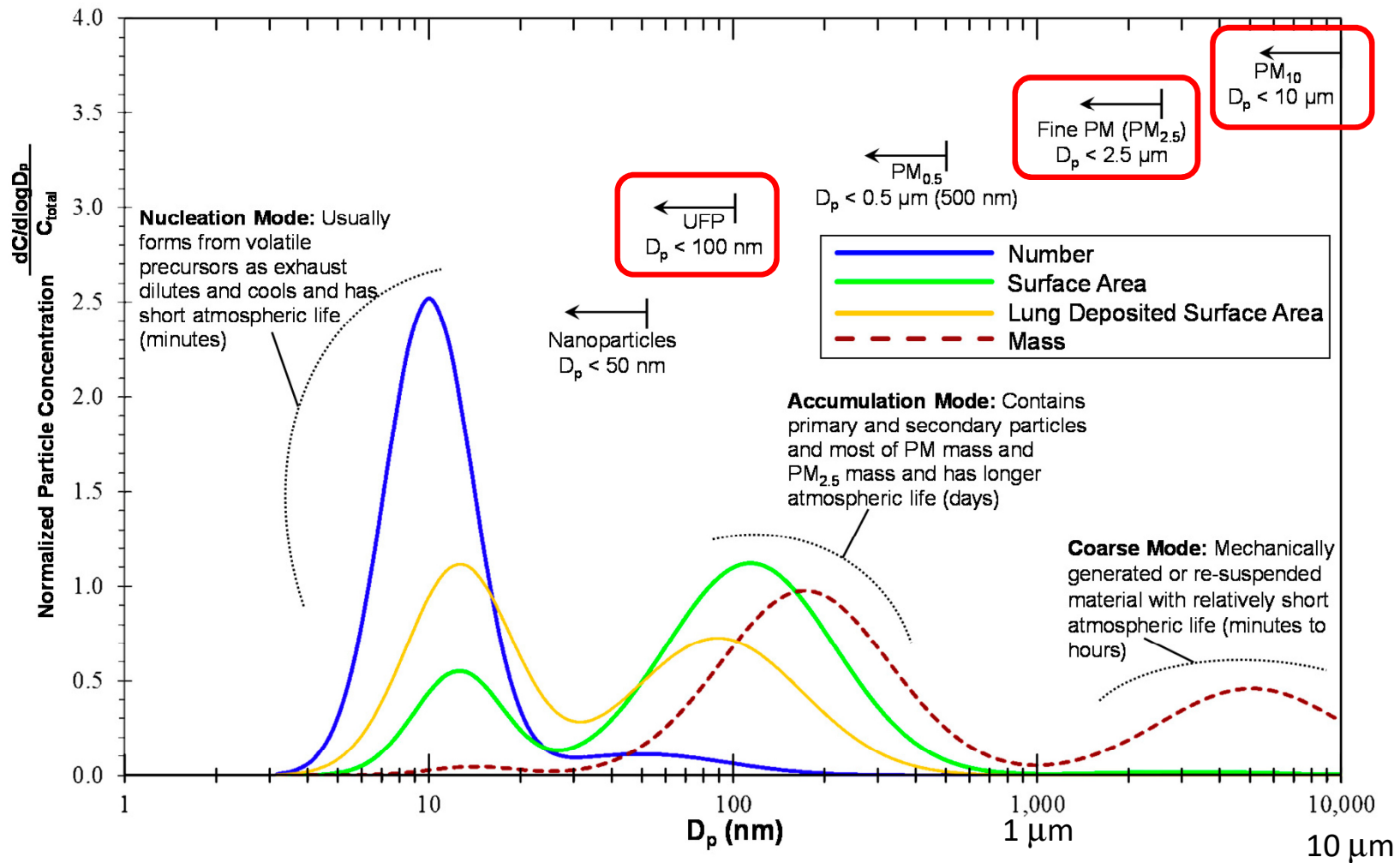


Come cambieranno gli standard di qualità dell'aria?

Pollutant	Averaging period	EU Air Quality Directives			WHO Air Quality Guidelines					
		Objective	Concentration	Comments	Concentration				AQG level	Comments
					1.	2.	3.	4.		
PM _{2.5}	24-hour	Target value			75	50	37,5	25	15 µg/m ³	99th percentile (i.e. 3-4 exc. Days/year)
PM _{2.5}	Annual	Limit value	25 µg/m ³		35	25	15	10	5 µg/m ³	
PM _{2.5}	Annual	Indicative limit value	20 µg/m ³							
PM ₁₀	24-hour	Limit value	50 µg/m ³	Not to be exceeded on more than 35 days/year	150	100	75	50	45 µg/m ³	99th percentile (i.e. 3-4 exc. Days/year)
PM ₁₀	Annual	Limit value	40 µg/m ³		70	50	30	20	15 µg/m ³	
O ₃	Max. daily 8-hour mean	Target value	120 µg/m ³	Not to be exceeded on more than 25 days/year (averaged over 3 years)						
O ₃	Max. daily 8-hour mean	Long-term objective	120 µg/m ³							
O ₃	8-hour	Target value			160	120	-	-	100 µg/m ³	99th percentile (i.e. 3-4 exc. Days/year)
O ₃	Peak season ^a	Target value			100	70	-	-	60 µg/m ³	
NO ₂	Hourly	Limit value	200 µg/m ³	Not to be exceeded on more than 18 hours/year					200 µg/m ³	
NO ₂	Annual	Limit value	40 µg/m ³		40	30	20	-	10 µg/m ³	
NO ₂	24-hour	Target value			120	50	-	-	25 µg/m ³	99th percentile (i.e. 3-4 exc. Days/year)
SO ₂	Hourly	Limit value	350 µg/m ³	Not to be exceeded on more than 24 hours/year						
SO ₂	24-hour	Limit value	125 µg/m ³	Not to be exceeded on more than 3 days/year	125	50	-	-	40 µg/m ³	99th percentile (i.e. 3-4 exc. Days/year)
CO	Max. daily 8-hour mean	Limit value	10 mg/m ³						10 mg/m ³	
CO	24-hour	Target value			7	-	-	-	4 mg/m ³	99th percentile (i.e. 3-4 exc. Days/year)
C ₆ H ₆	Annual	Limit value	5 µg/m ³						1,7 µg/m ³	Reference level
BaP	Annual	Target value	1 ng/m ³	Measured as content in PM ₁₀						
Pb	Annual	Limit value	0,5 µg/m ³	Measured as content in PM ₁₀					0,5 µg/m ³	
As	Annual	Target value	6 ng/m ³	Measured as content in PM ₁₀					6,6 ng/m ³	Reference level
Cd	Annual	Target value	5 ng/m ³	Measured as content in PM ₁₀					5 ng/m ³	
Ni	Annual	Target value	20 ng/m ³	Measured as content in PM ₁₀					25 ng/m ³	Reference level

Cosa si intende per UFP?



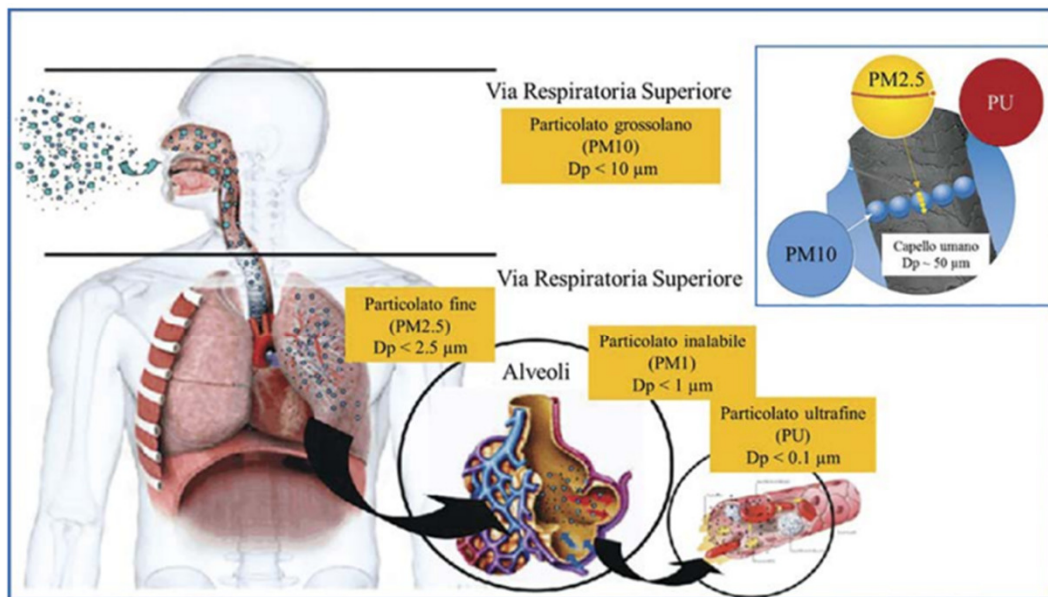
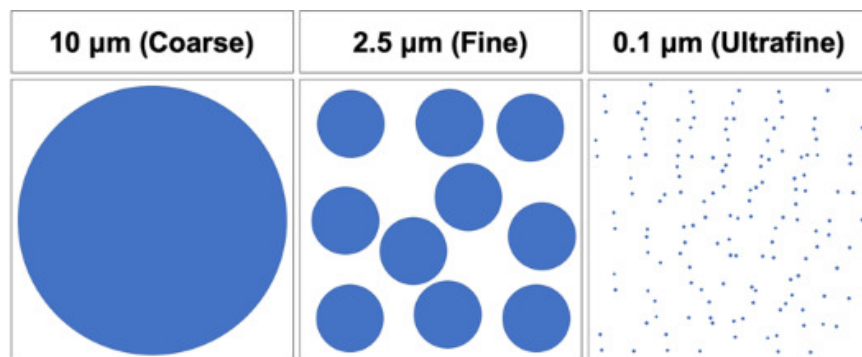


Figura 1 – Siti di deposizione per particolato atmosferico all'interno dell'apparato respiratorio. (Adattato da Guarieiro e Guarieiro, 2013)

Perché il particolato ultrafine?

Perché il numero di particelle?



	10 µm (Coarse)	2.5 µm (Fine)	0.1 µm (Ultrafine)
Total mass	1	1	1
Particle number	1	64	1,000,000
Surface area per particle	1	0.0625	0.0001
Total surface area per mass	1	4	100
	<ul style="list-style-type: none"> Filtered in proximal airway May irritate skin, mucosa 	<ul style="list-style-type: none"> Reaches peripheral airway Cannot enter systemic circulation 	<ul style="list-style-type: none"> Higher adsorbed toxic material on surface May enter systemic circulation

Cosa sappiamo su UFP in Campania?

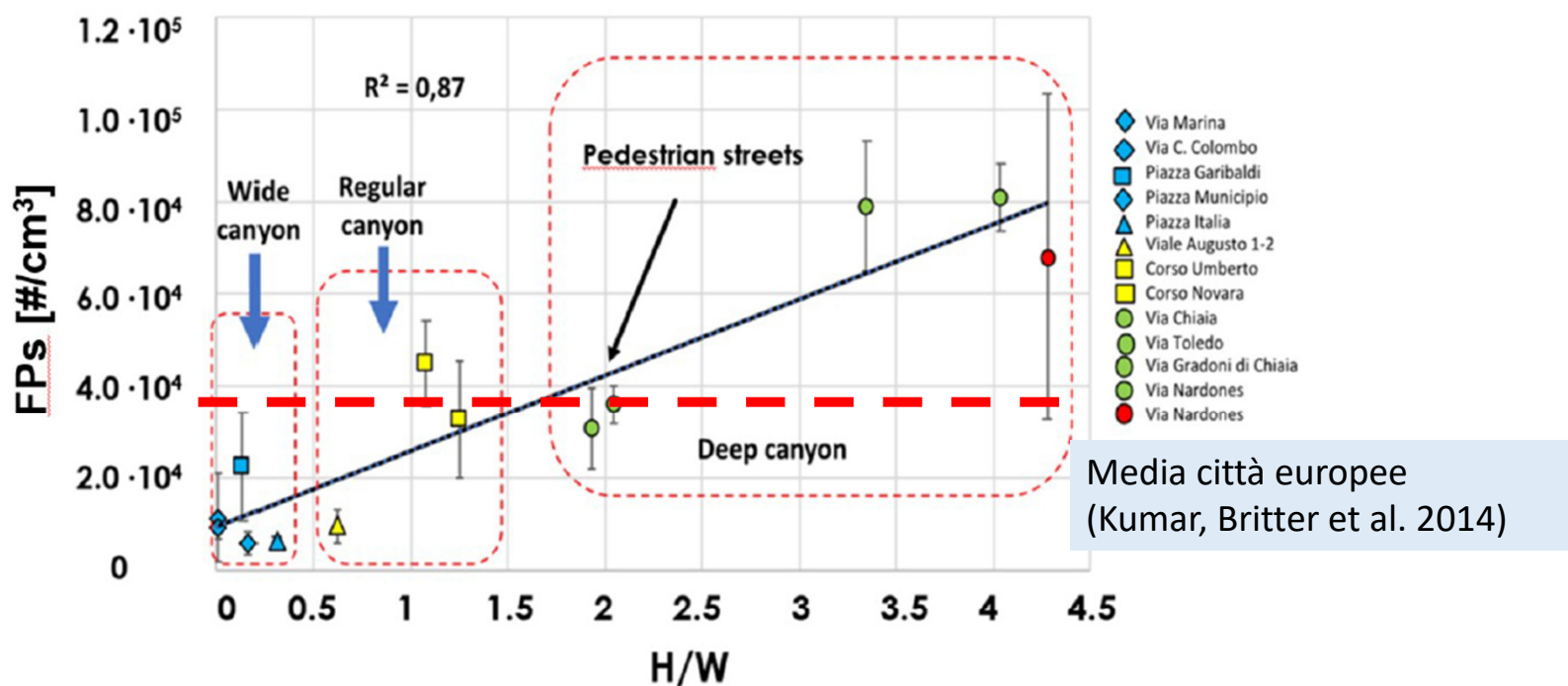


Figure 5. The effect of aspect ratio H/W on FPs concentration in Naples (green circles data are from this study, others are from [34]).



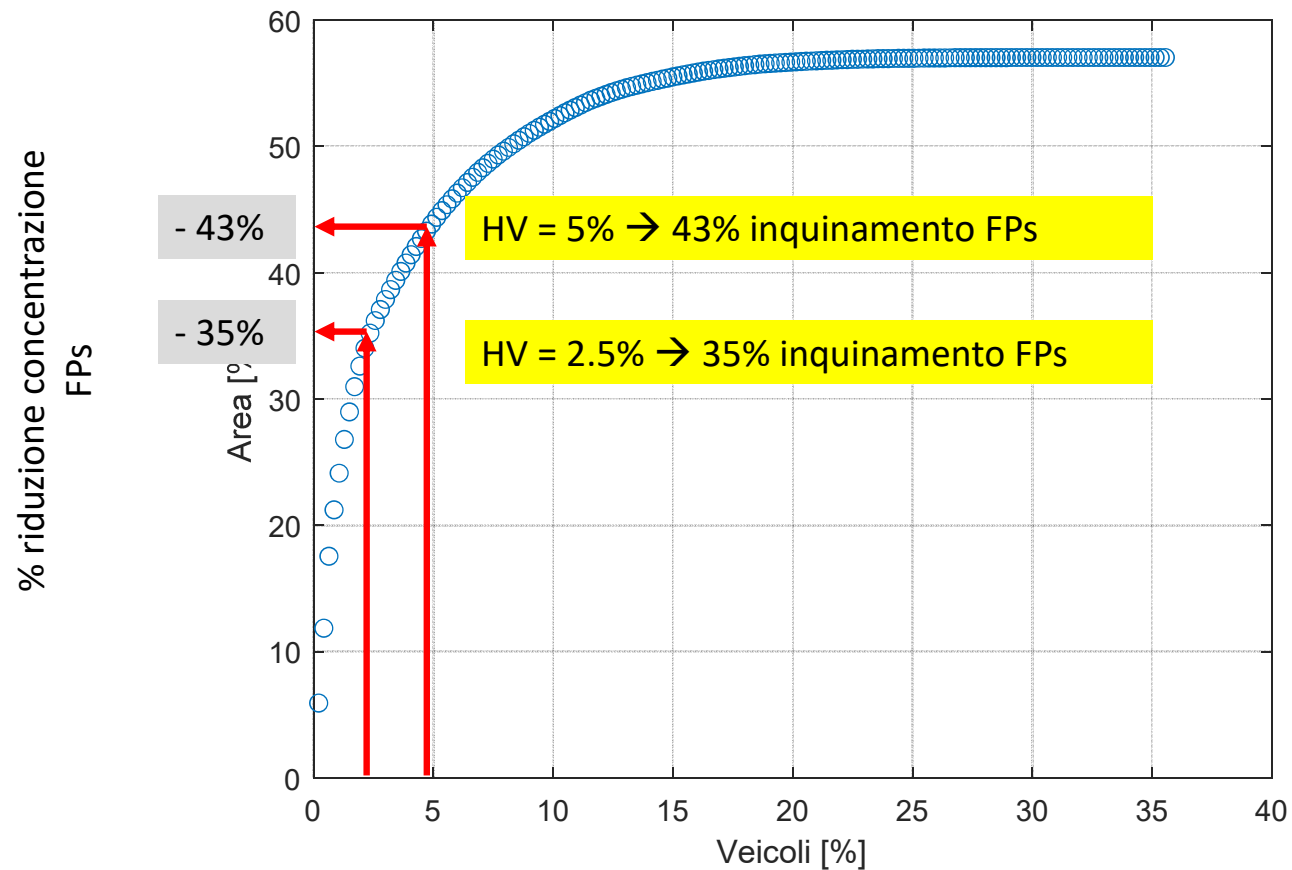
I veicoli ad elevate emissioni «High emitters»



I veicoli ad elevate emissioni «High emitters»



Il contributo all'inquinamento dei veicoli ad elevate emissioni



Emissioni navali



- Poche informazioni sulle emissioni di navi (HES)
- Molto probabile un contributo significativo



Conclusioni

- La normativa Europea stabilirà nuovi limiti più stringenti degli attuali entro il 2030
- Saranno necessari sforzi sempre maggiori ed efficaci per ridurre la concentrazione degli inquinanti in atmosfera
- Una efficace riduzione delle emissioni può realizzarsi anche individuando sorgenti (veicoli, navi, ...) che emettono fuori norma

**GRAZIE
PER L'ATTENZIONE**

