

# 1. Monitoring levels of PM<sub>10</sub> across CDMX

Particulate Matter, PM, affects more people than any other air pollutants. This is why PM<sub>10</sub> is one of six air pollutants which are constantly being measured by a network of monitoring stations across CDMX. The recommended limit of PM<sub>10</sub> over 24-hours is a mean value of 75 µm/m<sup>3</sup>.

Next you are going to investigate how the levels of PM<sub>10</sub> changes over a period of 7 days in some areas of CDMX. Your station and year are shown below.

STATION

MER  
Merced

LOCATION

Commercial and residential area in the city centre

YEAR

2000

LIMIT

75 µm/m<sup>3</sup>  
24-hour mean

The data collected by monitoring stations is used to inform citizens about the quality of air using an Air Quality Index. The table on the left shows you how the air quality index is obtained from the mean values of PM<sub>10</sub>. For example if a station measures a mean value of **PM<sub>10</sub> = 10 µm / m<sup>3</sup>** then the Air Quality Index is **Good**.

Air Quality Index	PM <sub>10</sub> VALUE in µm / m <sup>3</sup>
Good	0 to 50
Acceptable	50 to 75
Unhealthy	75 to 155
Very unhealthy	155 to 235
Extremely unhealthy	over 235

The table on the bottom shows you the mean values of PM<sub>10</sub> recorded by your local station for the first 7 days of April.

**Task 1:** Complete the Air Quality Index column for the first 7 days of April using the information on the table on the left.

Sometimes monitoring stations need maintenance or breakdown, so you may not have data for all of the days!

**Task 2:** Calculate the mean value of the PM<sub>10</sub> over the 7 days. Write it down at the bottom of your table.

**Remember:** To calculate the mean, add the values together and divide the total by the number of values.

MEAN =  $\frac{\quad + \quad + \quad + \quad + \quad + \quad +}{\quad}$

DATE	PM <sub>10</sub> VALUE in µm / m <sup>3</sup>	Air Quality Index
01 APR	76	Unhealthy
02 APR	81	
03 APR	98	
04 APR	67	
05 APR	81	
06 APR	---	
07 APR	101	
MEAN		

## 2. How levels of PM<sub>10</sub> have changed in the past 20 years in CDMX ?

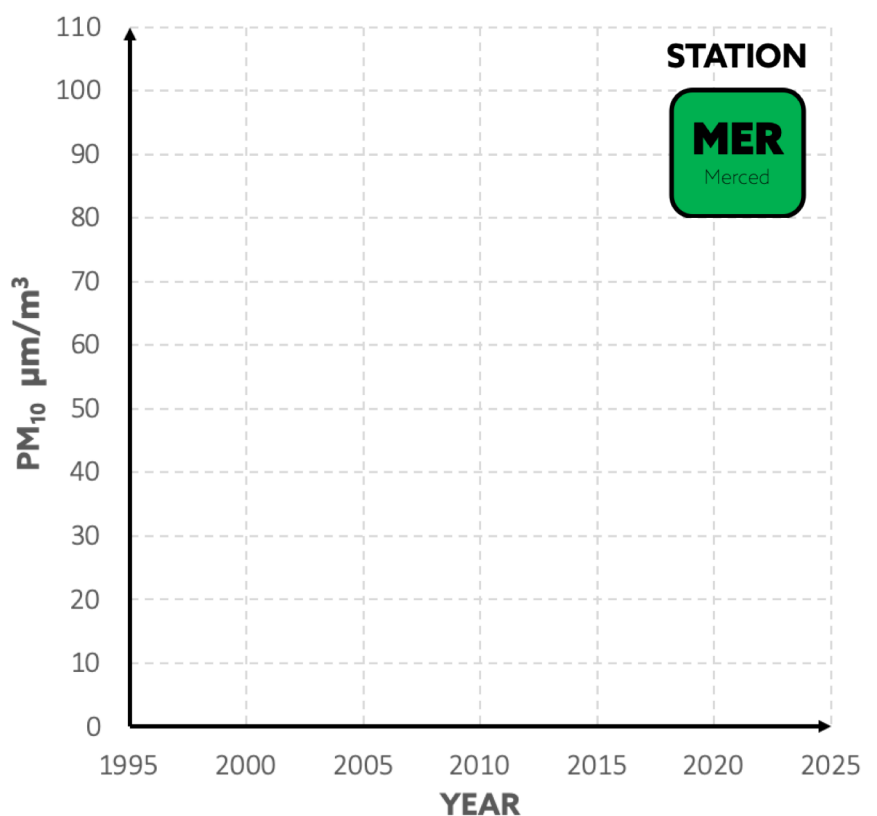
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**Task 3:** Write on the table below the 7-days **MEAN** value you calculated on the previous page. Make sure it is on the right **YEAR** cell! You can find the year of your the data on the previous page as well.

YEAR	MEAN in $\mu\text{m} / \text{m}^3$
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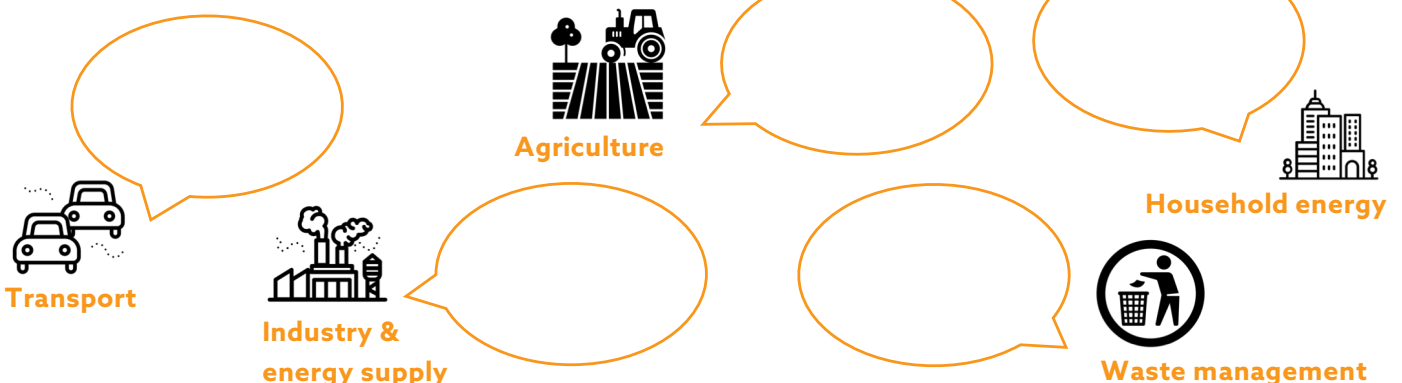
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Plot the values of PM<sub>10</sub> on the graph to help you understand if they have increase or decreased over the past 20 years.

### Question:

Can you suggest 3 ideas that could help reduce the levels of PM<sub>10</sub> over the next 5 years?

Who can help to put these ideas into practice?  
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PED

Pedregal

Residential area south of the city

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DATE	PM <sub>10</sub> VALUE in $\mu\text{m} / \text{m}^3$	Air Quality Index
01 APR	68	Acceptable
02 APR	62	
03 APR	80	
04 APR	42	
05 APR	53	
06 APR	58	
07 APR	75	
MEAN		

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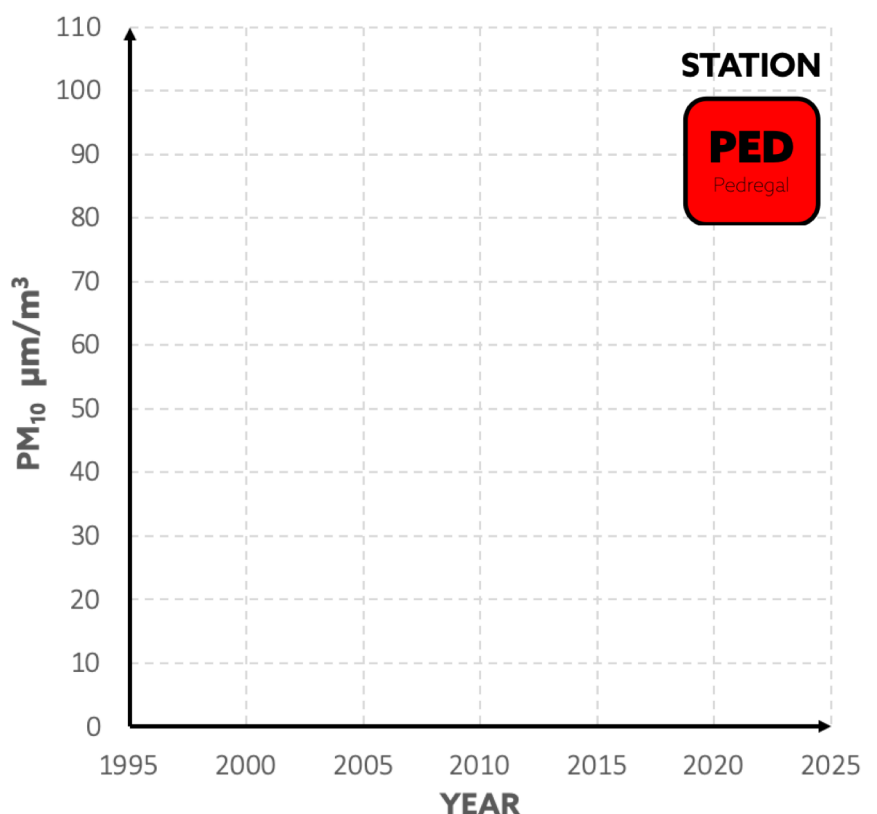
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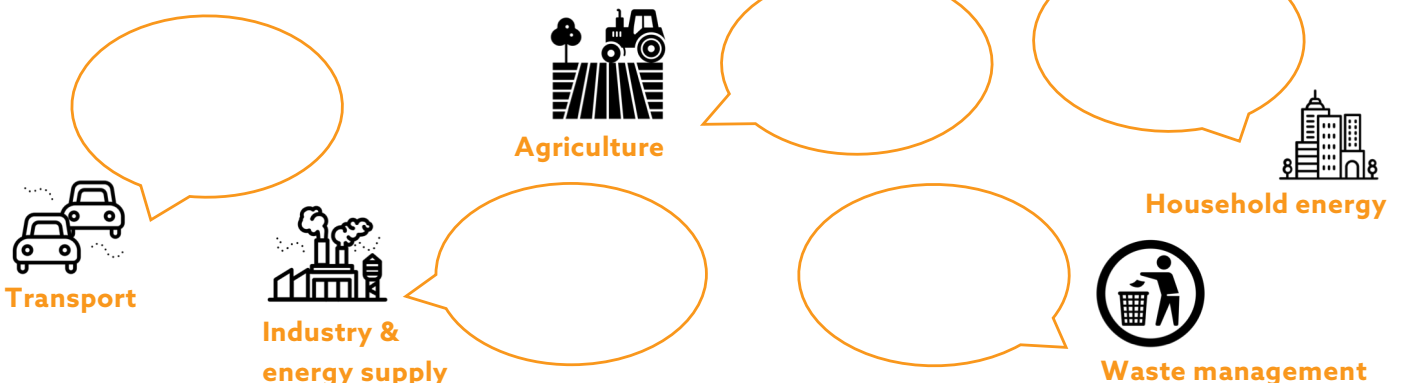
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VIF  
Vila de las Flores

LOCATION

Industrial area north of the city

YEAR

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LIMIT

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24-hour mean

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DATE	PM <sub>10</sub> VALUE in µm / m <sup>3</sup>	Air Quality Index
01 APR	80	Unhealthy
02 APR	92	
03 APR	79	
04 APR	47	
05 APR	---	
06 APR	---	
07 APR	---	
MEAN		

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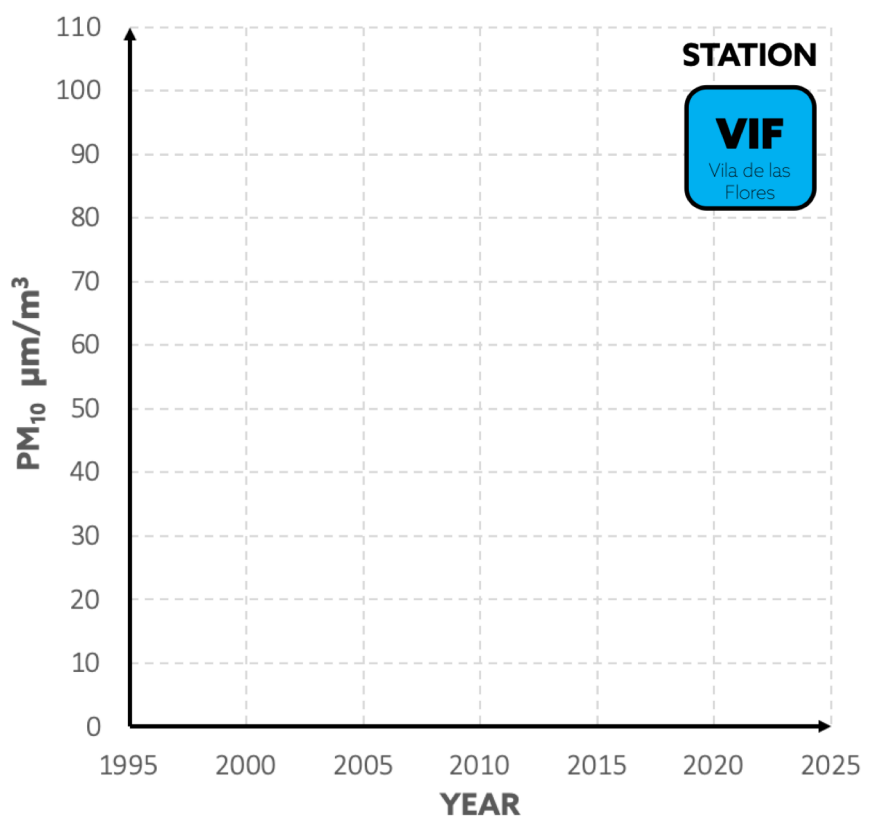
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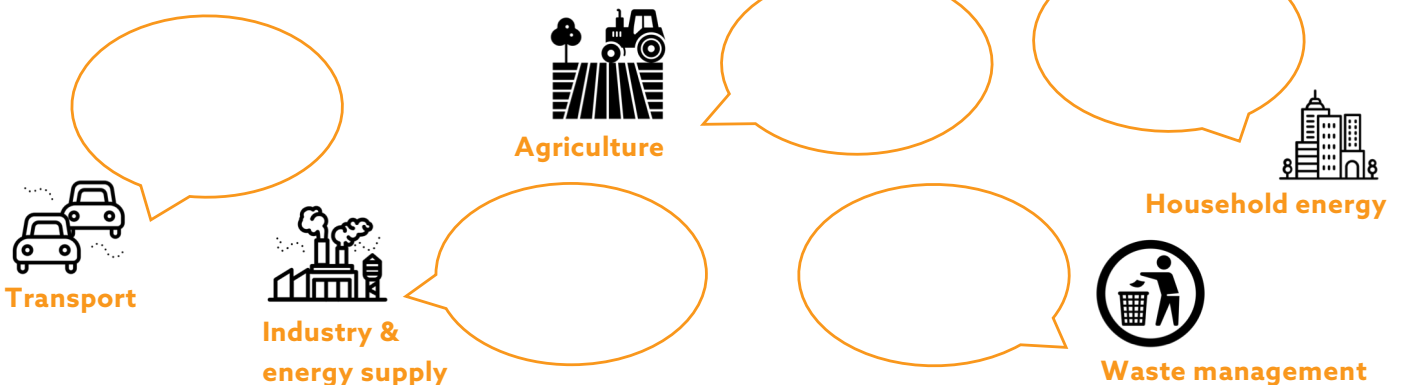
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01 APR	79	Unhealthy
02 APR	79	
03 APR	86	
04 APR	78	
05 APR	75	
06 APR	98	
07 APR	91	
MEAN		

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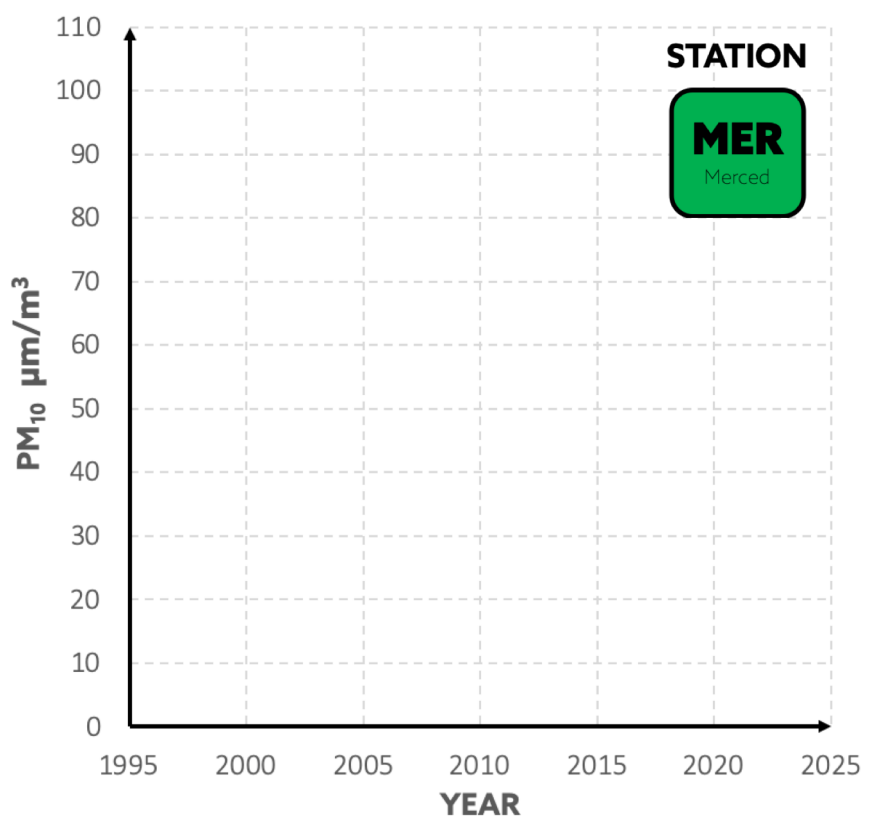
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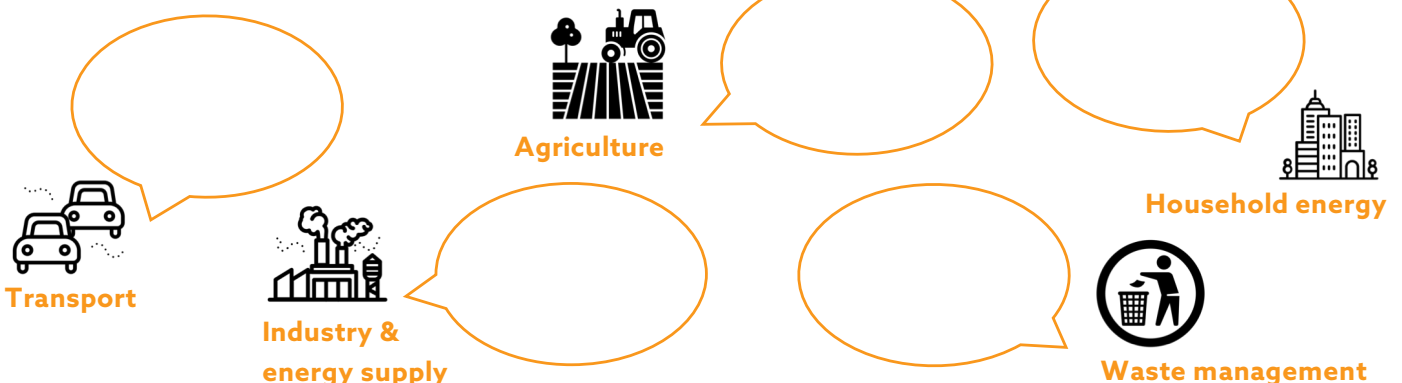
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01 APR	54	Acceptable
02 APR	57	
03 APR	50	
04 APR	52	
05 APR	50	
06 APR	63	
07 APR	66	
MEAN		

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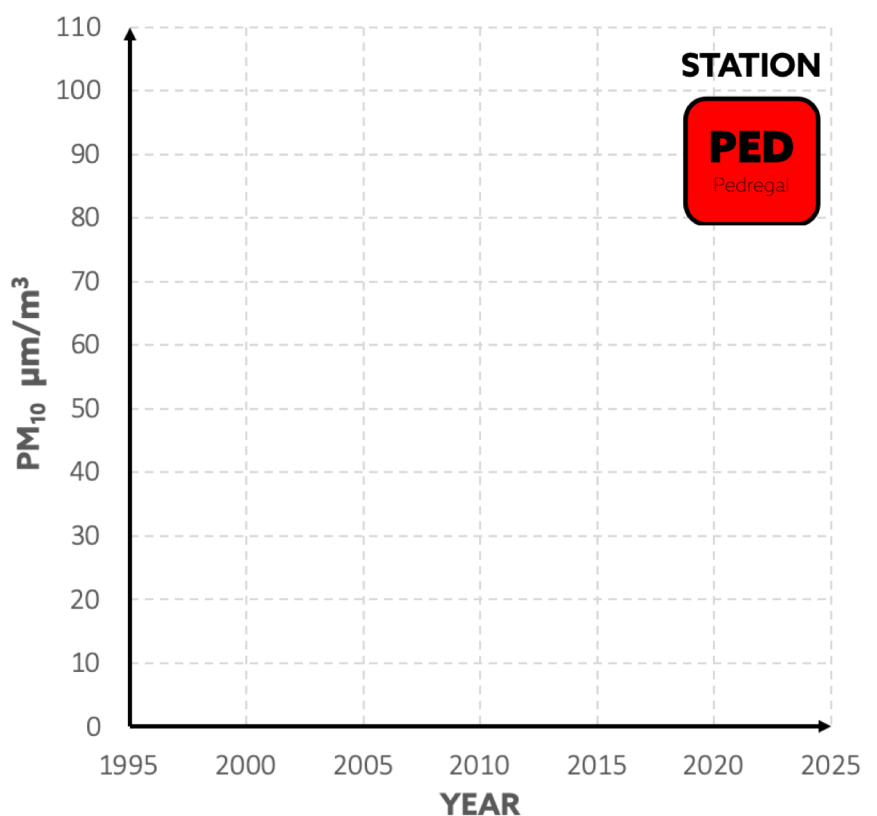
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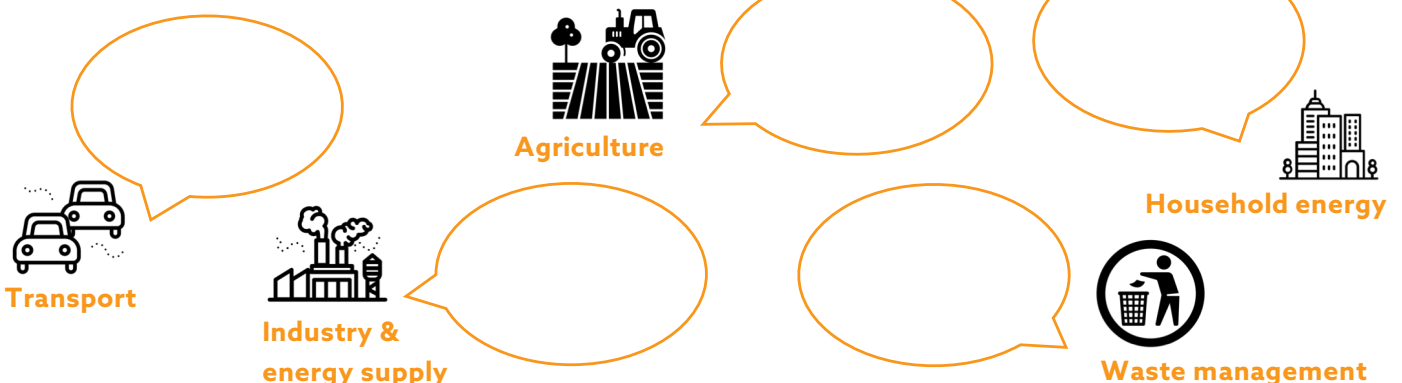
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**VIF**

Vila de las Flores

## LOCATION

Industrial area north of the city

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**75  $\mu\text{m}/\text{m}^3$**

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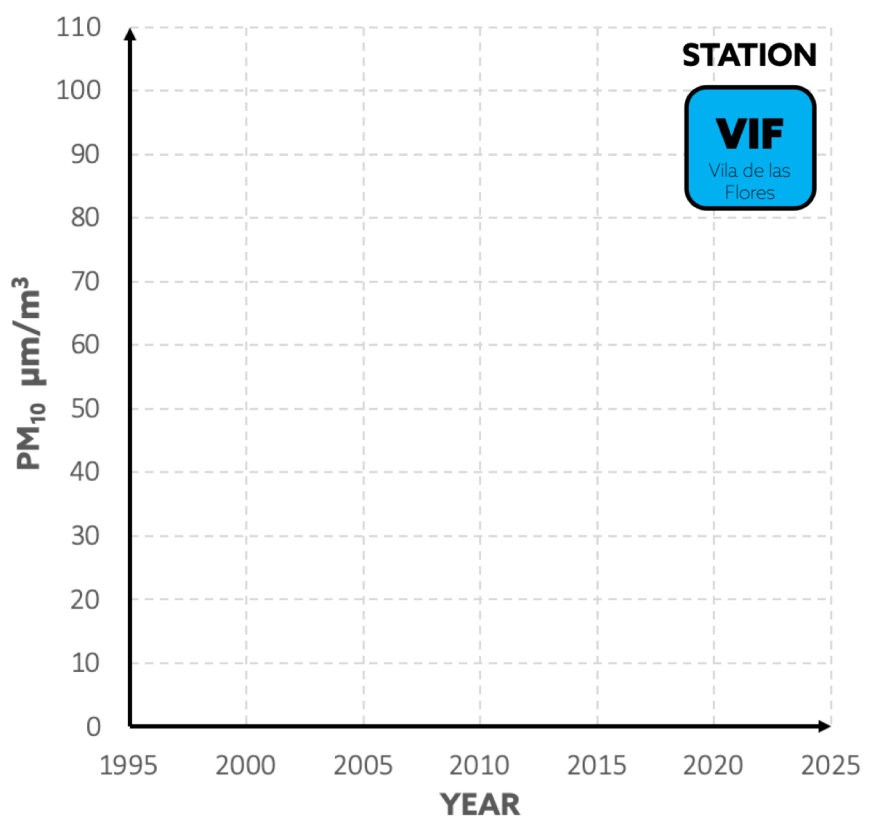
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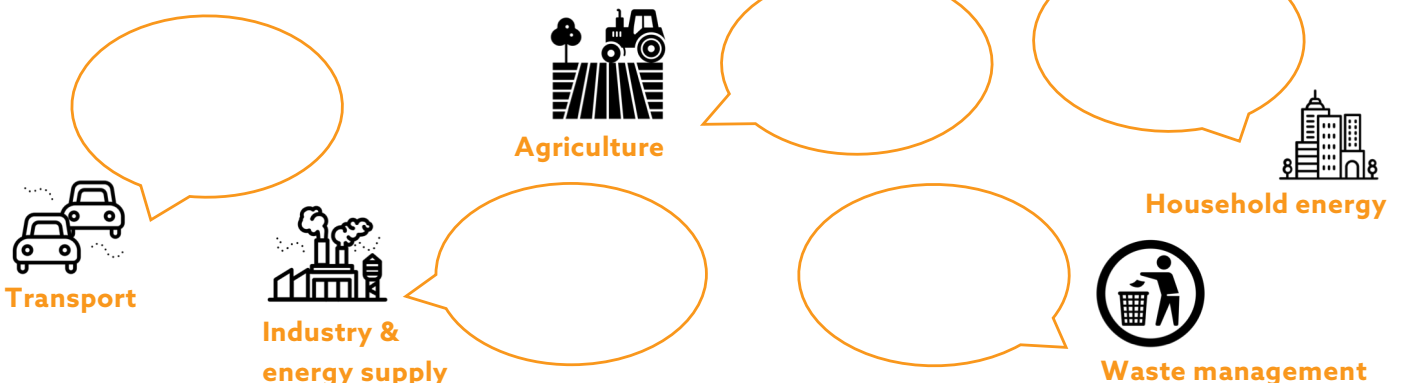
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02 APR	32	
03 APR	45	
04 APR	42	
05 APR	60	
06 APR	63	
07 APR	59	
MEAN		



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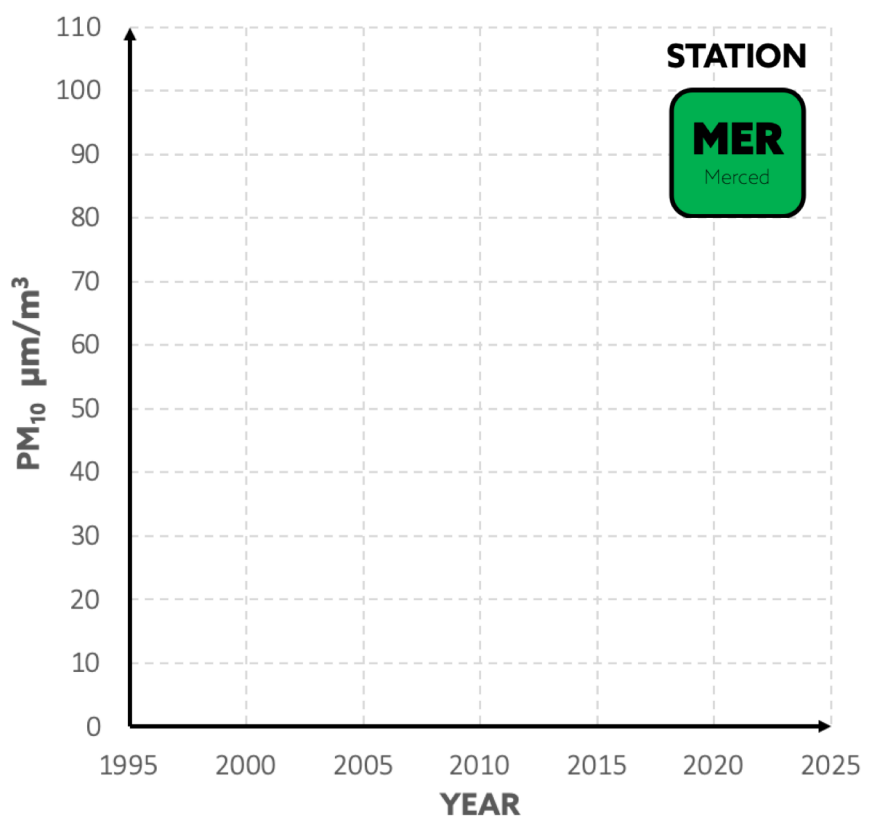
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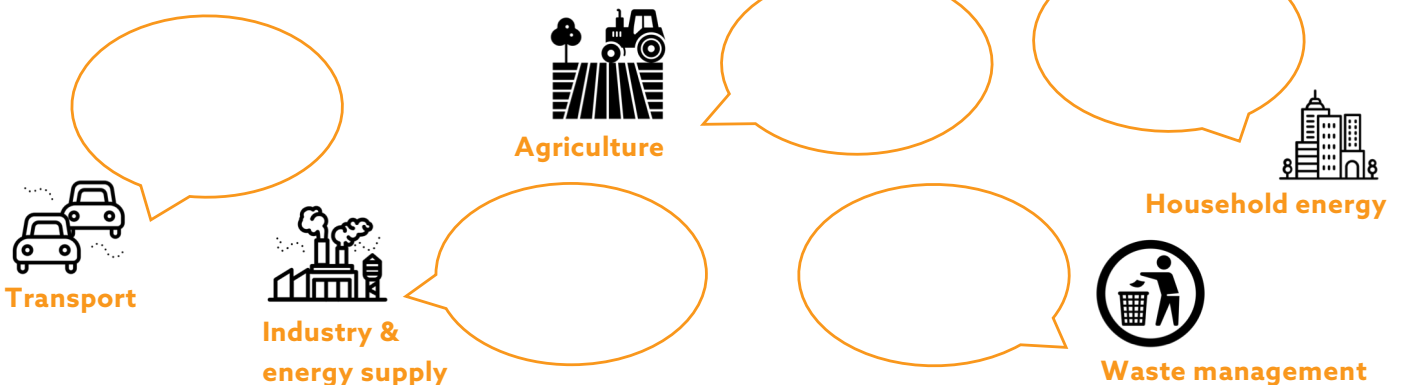
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**LOCATION**

Residential area  
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**2010**

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24-hour mean

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Extremely unhealthy	over 235

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MEAN =  $\frac{+ + + + + +}{7}$

DATE	PM <sub>10</sub> VALUE in $\mu\text{m} / \text{m}^3$	Air Quality Index
01 APR	---	
02 APR	---	
03 APR	---	
04 APR	---	
05 APR	---	
06 APR	51	Acceptable
07 APR	50	
MEAN		



## 2. How levels of PM<sub>10</sub> have changed in the past 20 years in CDMX ?

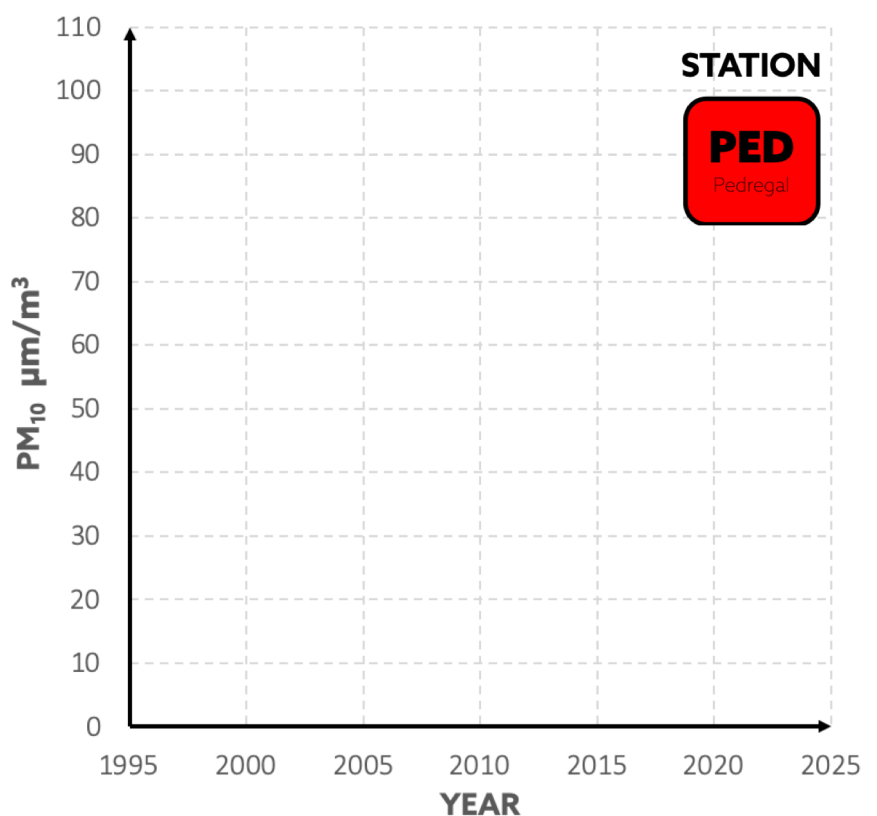
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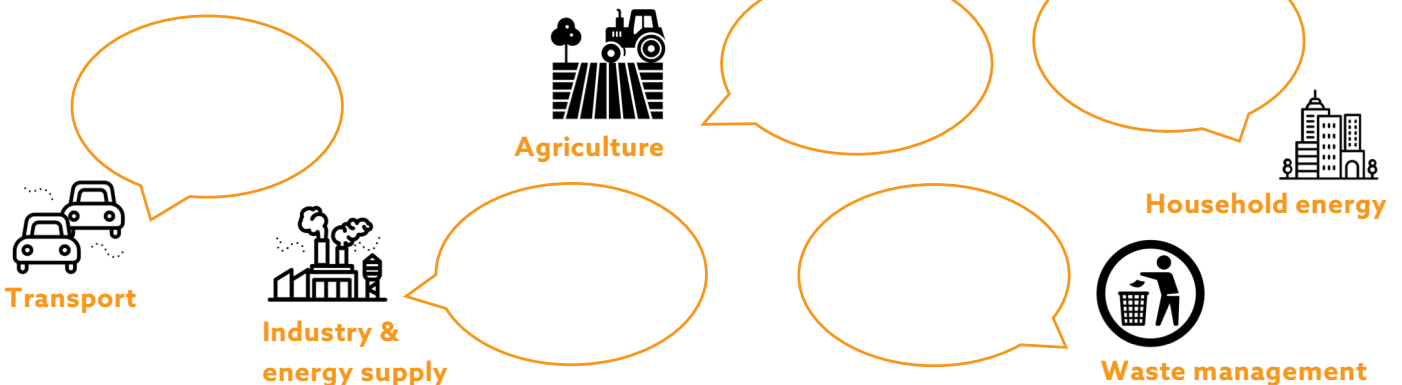
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Can you suggest 3 ideas that could help reduce the levels of PM<sub>10</sub> over the next 5 years?

Who can help to put these ideas into practice?  
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# 1. Monitoring levels of PM<sub>10</sub> across CDMX

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## STATION

**VIF**

Vila de las Flores

## LOCATION

Industrial area north of the city

## YEAR

**2010**

## LIMIT

**75  $\mu\text{m}/\text{m}^3$**

24-hour mean

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MEAN =  $\frac{+ + + + + + +}{7}$

DATE	PM <sub>10</sub> VALUE in $\mu\text{m}/\text{m}^3$	Air Quality Index
01 APR	68	Acceptable
02 APR	61	
03 APR	69	
04 APR	66	
05 APR	78	
06 APR	79	
07 APR	80	
MEAN		



## 2. How levels of PM<sub>10</sub> have changed in the past 20 years in CDMX ?

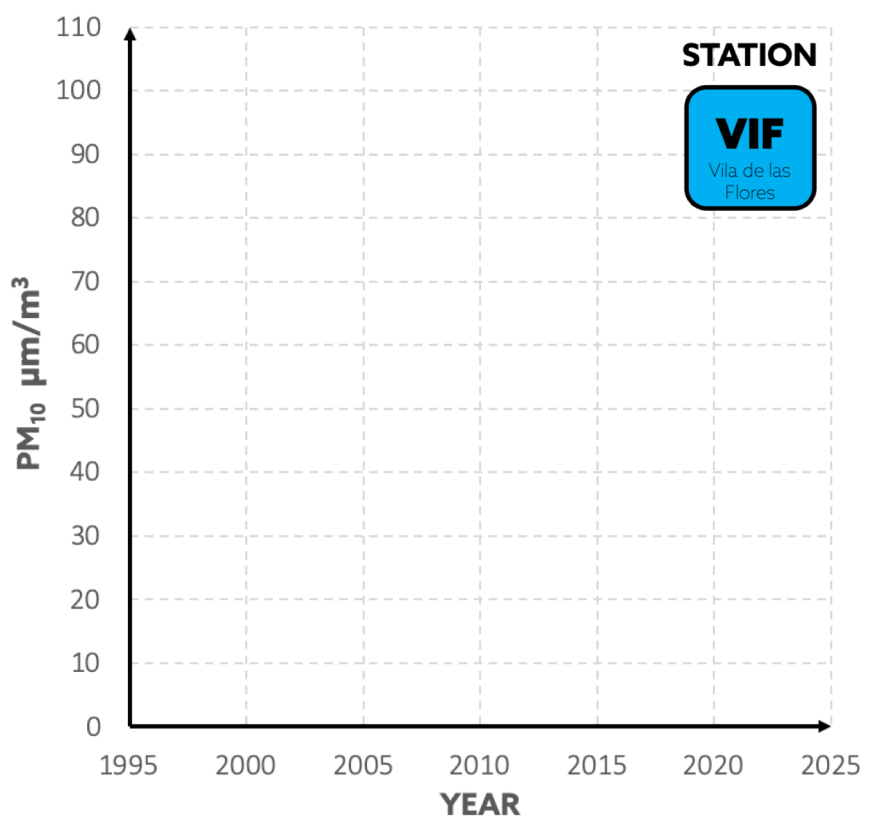
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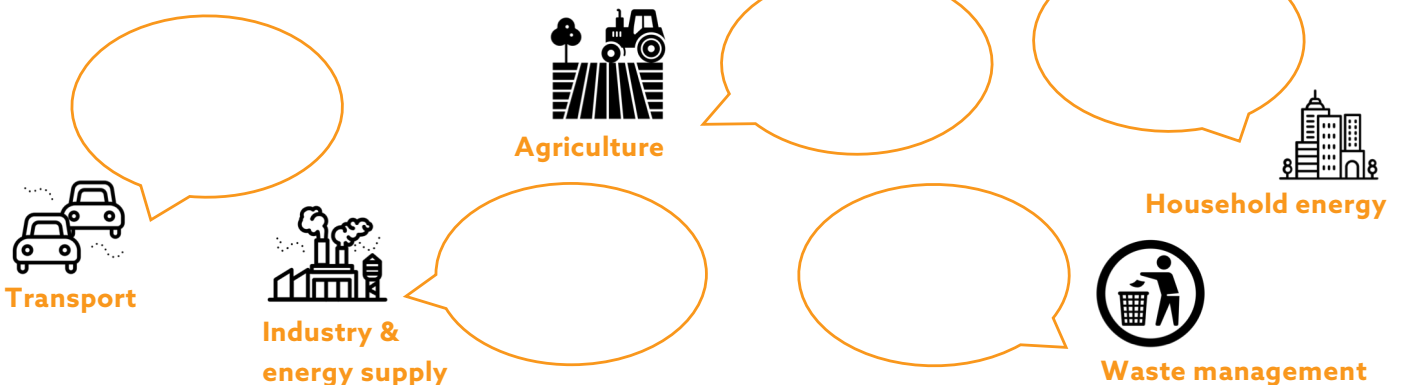
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STATION

**MER**

Merced

LOCATION

Commercial and residential area in the city centre

YEAR

**2015**

LIMIT

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01 APR	56	Unhealthy
02 APR	57	
03 APR	41	
04 APR	30	
05 APR	39	
06 APR	53	
07 APR	55	
MEAN		



## 2. How levels of PM<sub>10</sub> have changed in the past 20 years in CDMX ?

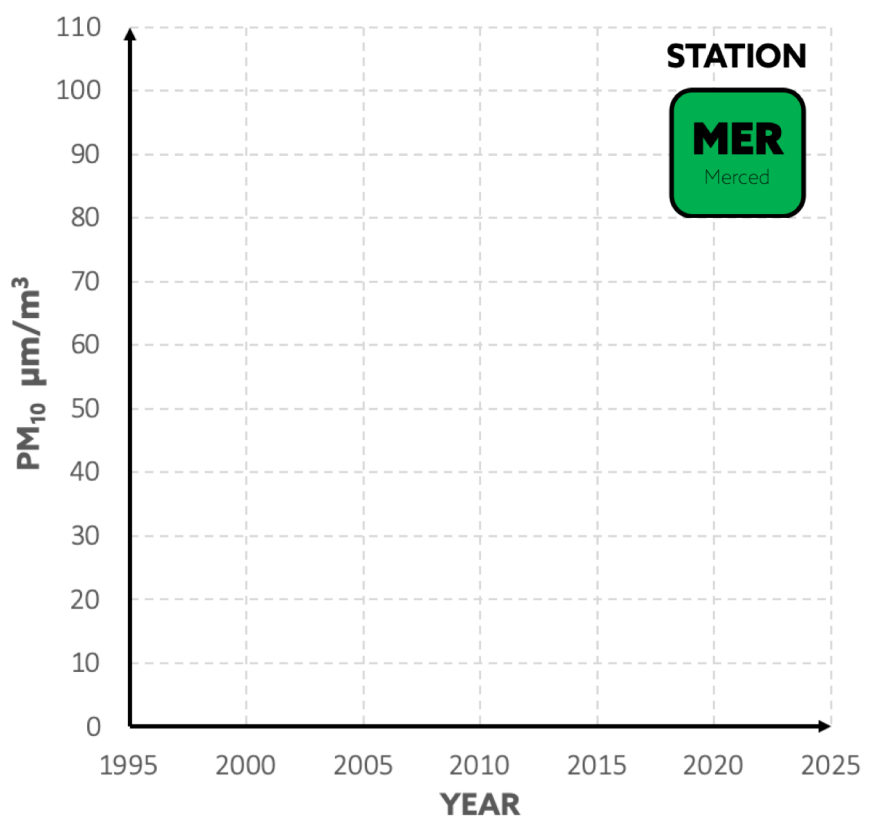
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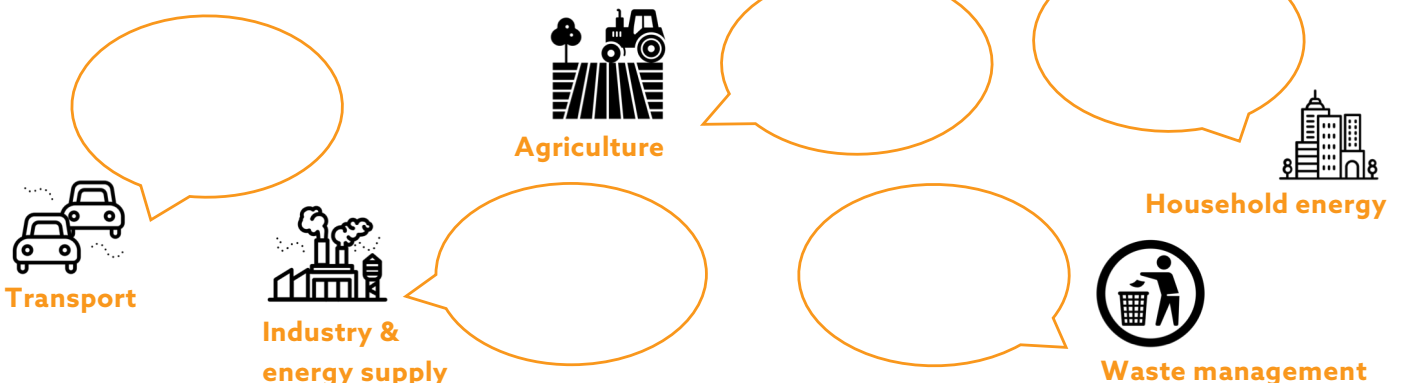
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**STATION**

**PED**

Pedregal

**LOCATION**

Residential area  
south of the city

**YEAR**

**2015**

**LIMIT**

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01 APR	48	Acceptable
02 APR	49	
03 APR	30	
04 APR	22	
05 APR	36	
06 APR	47	
07 APR	---	
MEAN		



## 2. How levels of PM<sub>10</sub> have changed in the past 20 years in CDMX ?

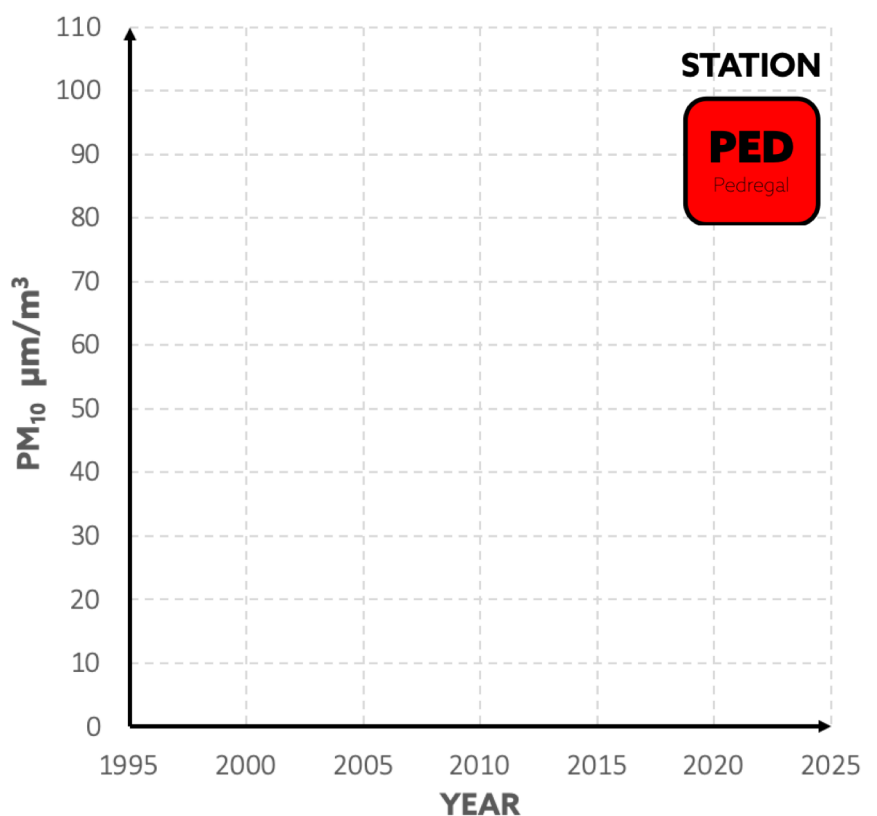
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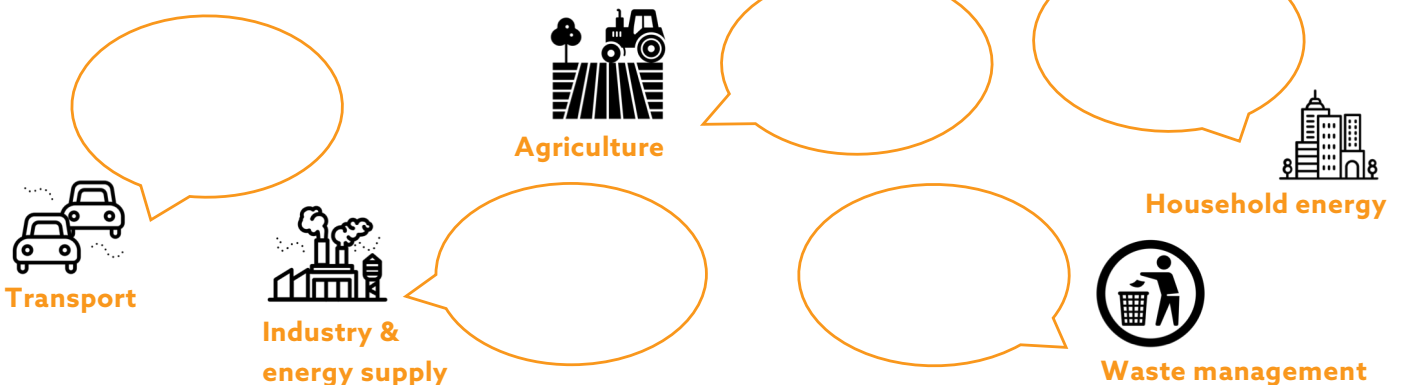
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01 APR	74	Unhealthy
02 APR	52	
03 APR	48	
04 APR	38	
05 APR	38	
06 APR	52	
07 APR	63	
MEAN		



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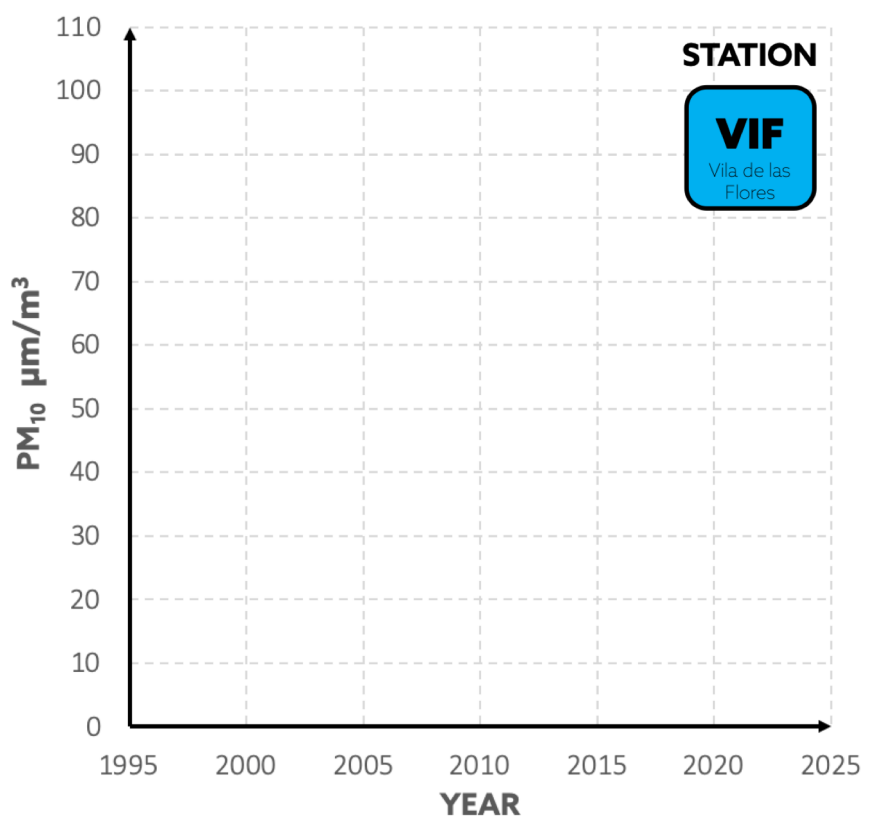
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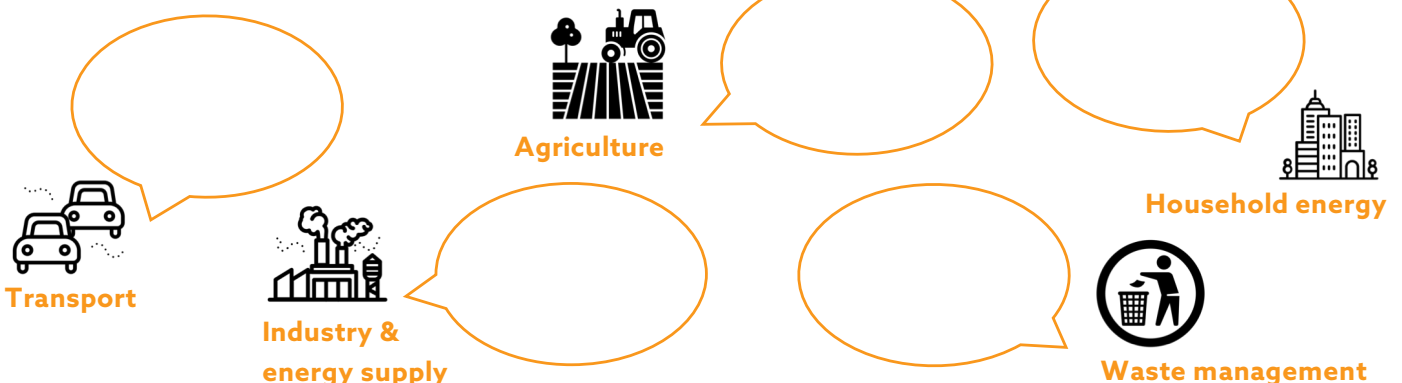
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02 APR	54	
03 APR	42	
04 APR	38	
05 APR	35	
06 APR	46	
07 APR	44	
MEAN		



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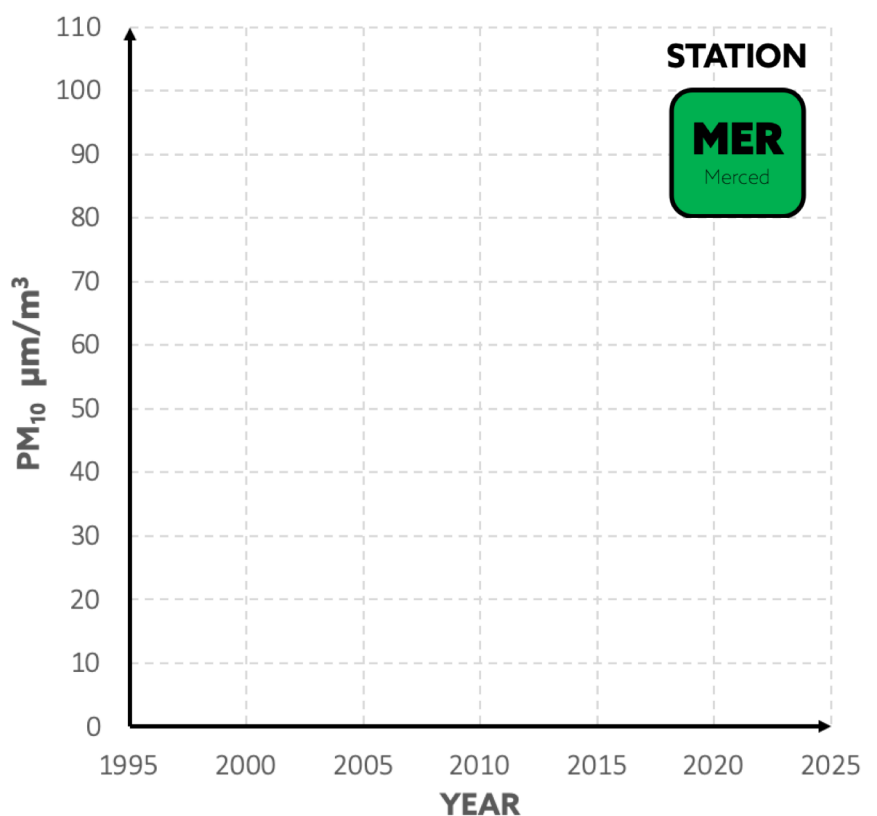
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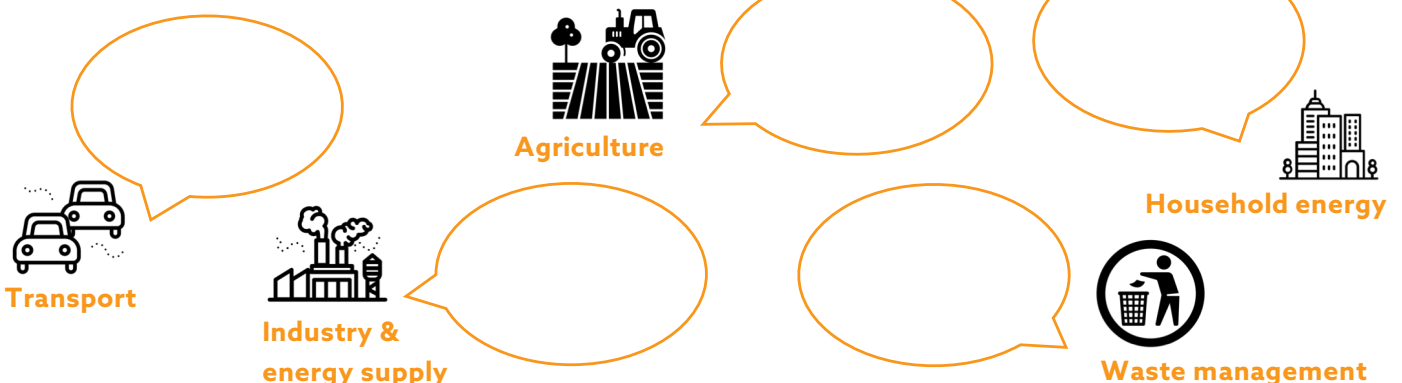
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**YEAR**

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02 APR	38	
03 APR	29	
04 APR	25	
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06 APR	32	
07 APR	32	
MEAN		



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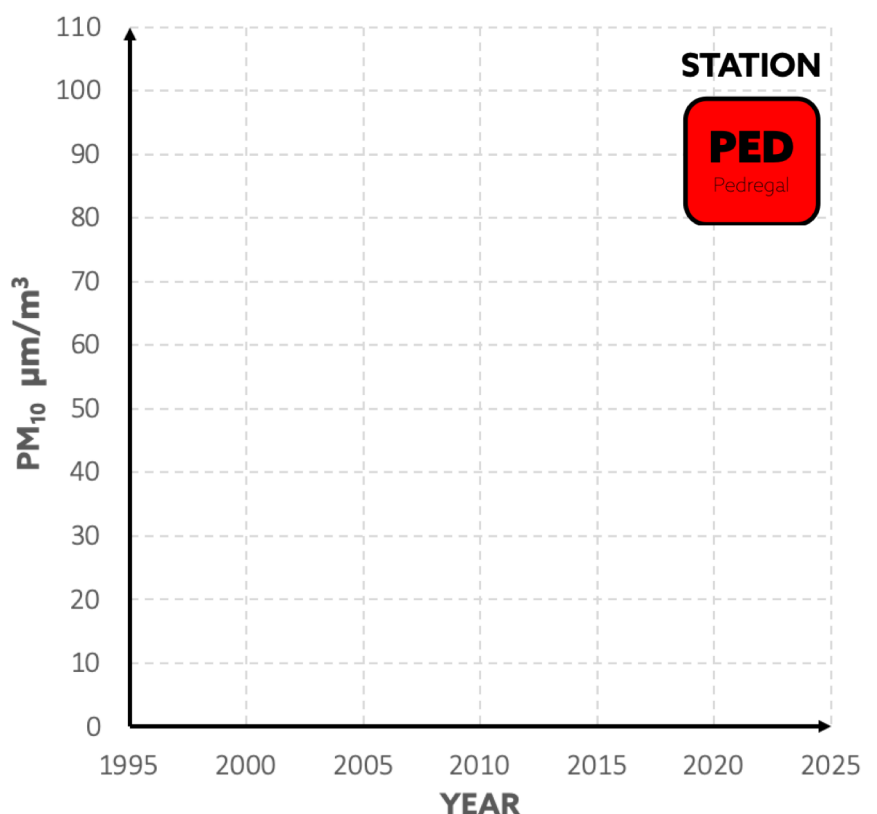
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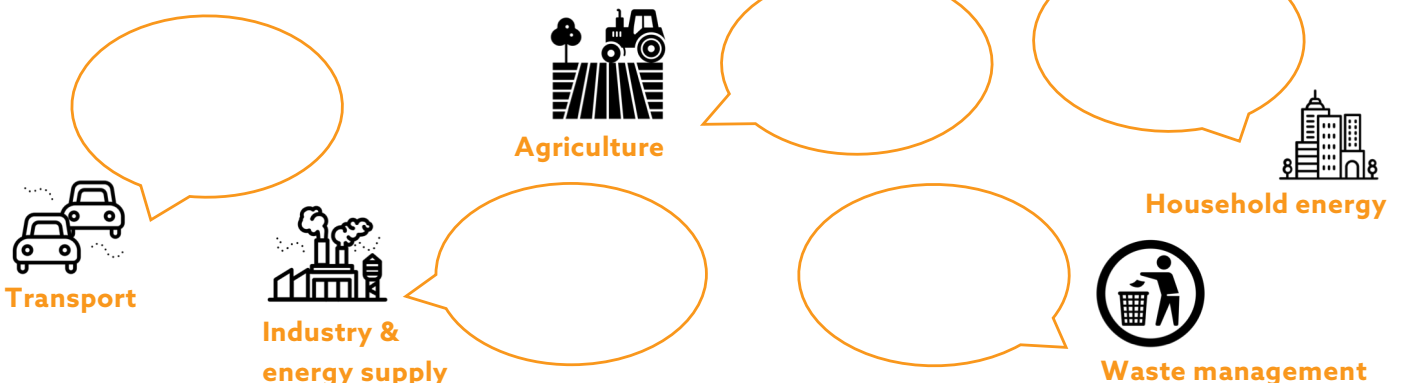
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## YEAR

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Very unhealthy	155 to 235
Extremely unhealthy	over 235

The table on the bottom shows you the mean values of PM<sub>10</sub> recorded by your local station for the first 7 days of April.

**Task 1:** Complete the Air Quality Index column for the first 7 days of April using the information on the table on the left.

Sometimes monitoring stations need maintenance or breakdown, so you may not have data for all of the days!

**Task 2:** Calculate the mean value of the PM<sub>10</sub> over the 7 days. Write it down at the bottom of your table.

**Remember:** To calculate the mean, add the values together and divide the total by the number of values.

MEAN =  $\frac{+ + + + + +}{7}$

DATE	PM <sub>10</sub> VALUE in $\mu\text{m} / \text{m}^3$	Air Quality Index
01 APR	63	Acceptable
02 APR	56	
03 APR	46	
04 APR	35	
05 APR	33	
06 APR	53	
07 APR	47	
MEAN		



## 2. How levels of PM<sub>10</sub> have changed in the past 20 years in CDMX ?

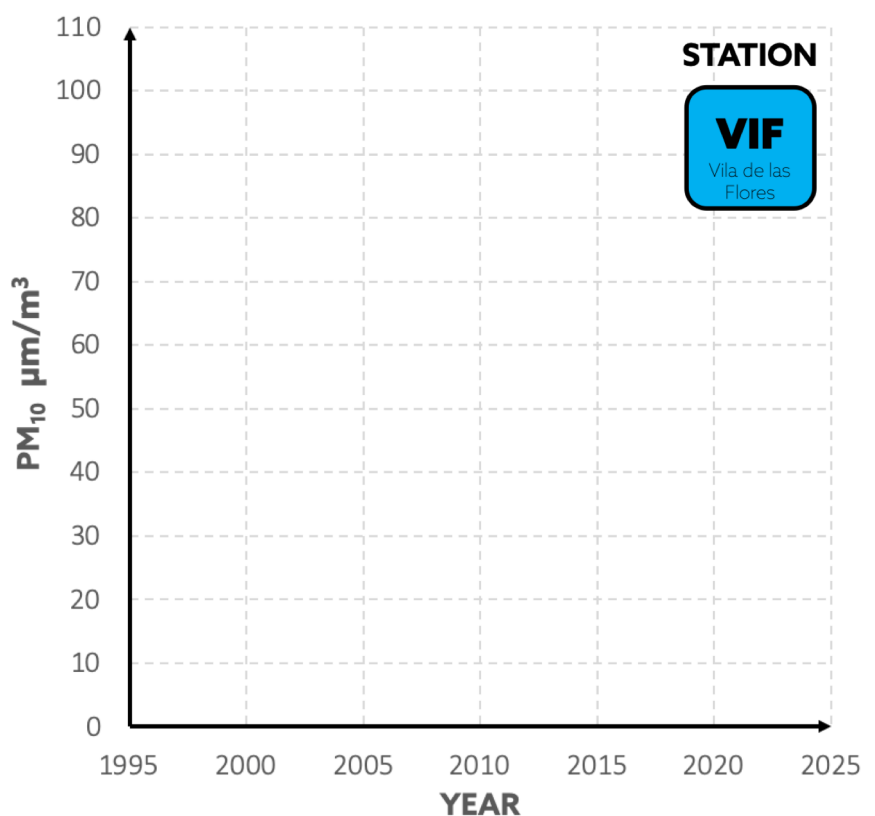
The network of monitoring stations across CDMX has been measuring the levels of PM<sub>10</sub> for over 20 years. Analysing this data helps us to understand how effective some measures are in creating cleaner air for everyone.

Let us investigate how levels of PM<sub>10</sub> have changed in the past 20 years in parts of CDMX.

**Task 3:** Write on the table below the 7-days **MEAN** value you calculated on the previous page. Make sure it is on the right **YEAR** cell! You can find the year of your the data on the previous page as well.

YEAR	MEAN in $\mu\text{m} / \text{m}^3$
2000	
2005	
2010	
2015	
2020	

**Task 4:** Find who in your classroom has calculated the 7-days **MEAN** values for the same station but for different years. This will help you to complete the table.



### Task 5:

Plot the values of PM<sub>10</sub> on the graph to help you understand if they have increase or decreased over the past 20 years.

### Question:

Can you suggest 3 ideas that could help reduce the levels of PM<sub>10</sub> over the next 5 years?

Who can help to put these ideas into practice?  
Link your ideas with the categories on the right.

