User Manual of ICET

1 Introduction

ICET (International Cost Estimate Tool) is a tool that can estimate the respective emission reductions and costs associated with future-year control strategies based on user-specified total emission reduction, and then generate emission control strategies. ICET tracks information about control measures, their costs, and the types of emissions sources to which they apply. The analysis results can provide decision support for policy-makers to work out better emission control strategies.

1.1 Evaluation Principle

ICET models the emission reductions by matching control measures to emission sources using algorithms such as "maximum emissions reduction", "least cost", and "apply measures in series". Control strategy results can be exported to CSV files or viewed in a graphical table that supports sorting, filtering, and plotting. ICET supports data transparency and provides a wide array of options for developing control strategies.

2 Installation Guide

2.1 Software requirements and Introduction

Minimum System Environment	
CPU	Intel, Duo-Core, 1.6GHz
Memory (RSM)	1G
Free Disk Space	2GB
Operation System	32-Bit,Window XP
Recommend System Environment	
CPU	Intel, Quad-Core, 3GHz
Memory (RSM)	2CB
Free Disk Space	10GB
Operation System	64-Bit,Windows 7

2.2 Installation

>Double-click **ICET Setup.exe**. It will bring you to the **Prepare** Window (Fig. 1)



Fig. 1 Preparing Installation

≻In Welcome Window (Fig. 2), click **Next** to **Destination Folder** window (Fig. 3). By default, ICET will be installed under C:**Program Files**(**X86**). If you want to save the software to another directory, please click **Change...** button to change current destination folder. Then click Next button, and enter the next window.



Fig. 2 Welcome Window

ig ICET - In	nstallShield Wizard
Destinat Click Ne	tion Folder ext to install to this folder, or click Change to install to a different folder.
	Install ICET to: C:\Program Files (x86)\ Change
InstallShield	< Back Next > Cancel

Fig. 3 Destination Folder

Click **Install** button (Fig. 4) to begin the installation .

😸 ICET - InstallShield Wizard	×
Ready to Install the Program The wizard is ready to begin installation.	S
Click Install to begin the installation.	ICET
If you want to review or change any of your installation settings, click Back. Click Cancel exit the wizard.	to
< <u>B</u> ack Install Can	cel

Fig. 4 Ready to Installation

Click **Finish** button (Fig. 5) to complete the installation.

	InstallShield Wizard Completed
ENVIRONMENTAL PROTECTION	The InstallShield Wizard has successfully installed ICET. Click Finish to exit the wizard.

Fig. 5 Installation is complete

2.3 Uninstallation

Select the Uninstall ICET item under Start \rightarrow All Programs \rightarrow ICET to remove ICET from your computer.

3 Main Interface

The main interface of ICET is shown in the following figure.



Fig. 6 Main Interface

Click **File** button or **Project** button on the toolbar of the main interface, there are three options that users can choose.

- 1) Go to file, click **Open Project** button, locate the *.proj file and open it.
- 2) Click New Project button to create a new project.
- 3) Click Save Project button to save a created project.

3.1 Control Input File

On the upper-left of the main interface (Fig. 6), there is a **control input file** option that users can choose. It contains the different pollutant's control cost of different sectors in different regions as shown in Fig. 7.

Region/Se	ector/Pol:	lutant Cor	ntrol Set	up & Input:	Control	Cost Setu	up & Input				
	Currency	RMB	Emission	sTon							
Available	Control_H	Control_S	Control_	FControl(%)	Region	Sector	Pollutan	tCurrent_E	Cost_Esti	Cost_Unit	(\$/ton)
Shanghai	Shanghai	PowerPlar	NOx	64.9	Shanghai	Power Pl	l a NOx	157215	5	1363.691	
Jiangsu		PowerPlar	S02	23		Power Pl	laNOx	157215	10	2727.382	
Zhejiang		PowerPlar	PM25	10		Power Pl	aNOx	157215	15	4091.074	
Other		Domestic	NOx	75.5		Power PI	aNOx	157215	20	5454.765	
		Domestic	S02	56.1		Power Pl	aNOx	157215	25	6818.456	
		Domestic	PM25	35		Power Pl	aNOx	157215	30	8182.147	
		Transport	NOx	82.2		Power Pl	aNOx	157215	35	8470.084	
		Transport	S02	56.1		Power PI	aNOx	157215	40	8758.02	
		Transport	PM25	77.6		Power PI	aNOx	157215	45	9045.956	
		Industry	NOx	75.5		Power Pl	aNOx	157215	50	9333.892	
		Industry	S02	56.1		Power PI	aNOx	157215	55	12351.54	
		Industry	PM25	35		Power PI	aNOx	157215	60	15369.18	
		Area	NOx	82.2		Power Pl	laNOx	157215	65	18386.83	
		Area	S02	56.1		Power PI	aNOx	157215	70	21404.47	
		Area	PM25	77.6		Power PI	aNOx	157215	75	40584.51	
	Jiangsu	PowerPlar	NOx	75.9		Power Pl	aNOx	157215	80	59764.55	
		PowerPlar	S02	58.4		Power PI	aNOx	157215	85	78944.58	
		PowerPlar	PM25	78.4		Power Pl	laNOx	157215	90	98124.62	
		Domestic	NOx	69.5		Power PI	aNOx	157215	95	117304.7	
		Domestic	S02	74.5		Power PI	a SO2	86731	5	334.228	
		Domestic	PM25	73.5		Power Pl	a SO2	86731	10	668.4561	
		Transport	NOx	75.7		Power PI	a SO2	86731	15	1002.684	
		Transport	S02	74.5		Power PI	a SO2	86731	20	1336.912	
		Transport	PM25	86		Power Pl	la SO2	86731	25	1671.14	
		Industry	NOx	69.5		Power PI	a SO2	86731	30	2005.368	
		Industry	S02	74.5		Power Pl	a SO2	86731	35	2561.809	
		Industry	PM25	73.5		Power PI	a SO2	86731	40	3118.249	
		Area	NOx	75.7		Power PI	≥S02	86731	45	3674.689	
		Area	S02	74.5		Power Pl	a SO2	86731	50	4231.13	
		Area	PM25	86		Power PI	a SO2	86731	55	12379.14	

Fig. 7 Control Input File

3.2 Available Regions and Selected Regions

After open an Control Input File, users can extract the regions from the **Available Regions** column to the **Selected Regions** column on the bottom left of the main interface (Fig. 6) according to their own requirements.

3.3 Pollutant Control

In this module, it's mainly for users to set emission reduction ratio according to their own need to control pollutant as shown in Fig. 8.



Fig. 8 Pollutant Control

4 System Input

ICET clearly define input files. Click **System Input** button, then users can see the input files, it contains two aspects: **Regional control & Cost** and **Cost Curve**. ≻Fig. 9 lists **Current Emission**, **Cost Estimate** and **Cost Unit** of different pollutants in the selected regions.

۲.	Ř		Surtem Input					
ollutant control:			System input	System Ou	tput			
hanghai Jiangsu Zhejiang			Regional Co	ntrolacost	Cost Curve			
PowerPlant		Âl	Region	Sector	Pollutant	Current_Emission (ton)	Cost_Estimate(%)	Cost_Unit(\$/ton)
NOx Emission Reduction (%)	55.7		Shanghai	Power Pl	NOx	157215	5	818.2147488
			Shanghai	Power Pl	NOx	157215	10	1636.429498
SO2 Emission Reduction (%)	31.4		Shanghai	Power Pl	NOx	157215	15	2454.644246
			Shanghai	Power PI	NOx	157215	20	3272.858995
PM25 Emission Reduction (%)	20.1		Shanghai	Power Pl	NOx	157215	25	4091.073743
· ····································	20.1		Shanghai	Power Pl	NOx	157215	30	4909.288492
Domestic		-	Shanghai	Power Pl	NOx	157215	35	5082.050131
NOx Emission Reduction (%)	29.7	=	Shanghai	Power Pl	NOx	157215	40	5254.81177
			Shanghai	Power Pl	NOx	157215	45	5427.573409
SO2 Emission Reduction (%)	48.5		Shanghai	Power Pl	NOx	157215	50	5600.335048
			Shanghai	Power Pl	NOx	157215	55	7410.922236
PM25 Emission Reduction (%)	19.6		Shanghai	Power PI	NOx	157215	60	9221.509422
-	10.0		Shanghai	Power Pl	NOx	157215	65	11032.09661
Transport			Shanghai	Power Pl	NOx	157215	70	12842.68379
NOX Emission Reduction (%)	43.7		Shanghai	Power Pl	NOx	157215	75	40584.5102
			Shanghai	Power Pl	NOx	157215	80	59764.54741
SO2 Emission Reduction (%)	48.5		Shanghai	Power Pl	NOx	157215	85	78944.58462
			Shanghai	Power Pl	NOx	157215	90	98124.62183
PM25 Emission Reduction (%)	65.5		Shanghai	Power Pl	NOx	157215	95	117304.659
			Shanghai	Power PI	NOx	157215	100	136484.6962
			Shanghai	Power Pl	SO2	86731	5	267.3824258
NUX Emission Reduction (%)	29.7		Shanghai	Power Pl	SO2	86731	10	534.7648518
		+	Shanghai	Power Pl	SO2	86731	15	802.1472776
			Shanghai	Power Pl	SO2	86731	20	1069.529703
			Shanghai	Power Pl	SO2	86731	25	1336.91213

Fig. 9 Regional Control & Cost

> Fig. 10 displays **Cost Curve** of different emission removal ratio in different regions, So we can compare the cost curve of different pollutants and sectors. It allows users to select one or multiples regions in the left side of the interface to draw the cost curve.



Fig. 10 Cost Curve

5 Case study in China

In order to better introduce how to use ICET, we will take a case study in China for example.

5.1 Create a new project

Click File or Project button, and choose New Project option to create a new project.

5.2 Set configuration file

≻Click the file button is in the upper-left of the main interface to select a Control Input File and open it.

Select one or more of the four options in the **Available Regions** column as shown in the Fig. 11, and then click button, the selected options will appear in the **Selected Regions** column which as shown in the following figure.(Fig. 12-Fig. 13)

File Proje	ct About								
		15							
Control Input I	10.		System Input	System Ou	tput				
E-\ICET 0.14\Dat	allCET Config C	bina VPD ev	Regional C	ontrol&Cost	Cost Curve				
1.(1021-0.14(Dat			Region	Sector	Pollutant	Current_Emission (ton)	Cost_Estimate(%)	Cost_Unit(\$/ton)	* 11
Available Region	<u>15:</u>	Selected Regions:	Shanghai	Power Pl	NOx	157215	5	818.2147488	
Shanghai Jiangsu		Shanghai Jiangsu	Shanghai	Power Pl	NOx	157215	10	1636.429498	
Zhejiang		Zhejiang	Shanghai	Power PI	NOx	157215	15	2454.644246	
oner			Shanghai	Power Pl	NOx	157215	20	3272.858995	
			Shanghai	Power Pl	NOx	157215	25	4091.073743	
			Shanghai	Power Pl	NOx	157215	30	4909.288492	
			Shanghai	Power PI	NOx	157215	35	5082.050131	
			Shanghai	Power Pl	NOx	157215	40	5254.81177	
	>>		Shanghai	Power Pl	NOx	157215	45	5427.573409	
			Shanghai	Power Pl	NOx	157215	50	5600.335048	
			Shanghai	Power PI	NOx	157215	55	7410.922236	
	~~		Shanghai	Power Pl	NOx	157215	60	9221.509422	
			Shanghai	Power Pl	NOx	157215	65	11032.09661	
			Shanghai	Power Pl	NOx	157215	70	12842.68379	
			Shanghai	Power PI	NOx	157215	75	40584.5102	
			Shanghai	Power Pl	NOx	157215	80	59764.54741	
			Shanghai	Power Pl	NOx	157215	85	78944.58462	
			Shanghai	Power Pl	NOx	157215	90	98124.62183	
			Shanghai	Power PI	NOx	157215	95	117304.659	
			Shanghai	Power Pl	NOx	157215	100	136484.6962	
			Shanghai	Power Pl	SO2	86731	5	267.3824258	
			Shanghai	Power Pl	SO2	86731	10	534.7648518	
			Shanghai	Power PI	SO2	86731	15	802.1472776	
			Shanghai	Power Pl	SO2	86731	20	1069.529703	
			Shanghai	Power Pl	SO2	86731	25	1336.91213	
		Back Next							•

Fig. 11 Available Regions

File Project About							
	System Inpu	t System Ou	Itput				
Control Input File:	Regional (Control&Cost	Cost Curve				
F:\ICET 0.14\Data\ICET_Config_China_YRD_ex	Region	Sector	Pollutant	Current_Emission (ton)	Cost_Estimate(%)	Cost_Unit(\$/ton)	^ =
Available Regions: Selected Regi	ons: Shanghai	Power Pl	NOx	157215	5	818.2147488	
Shanghai Shanghai Jiangsu	Shanghai	Power Pl	NOx	157215	10	1636.429498	
Zhejiang	Shanghai	Power Pl	NOx	157215	15	2454.644246	
other	Shanghai	Power PI	NOx	157215	20	3272.858995	
	Shanghai	Power Pl	NOx	157215	25	4091.073743	
	Shanghai	Power Pl	NOx	157215	30	4909.288492	
	Shanghai	Power Pl	NOx	157215	35	5082.050131	
	Shanghai	Power PI	NOx	157215	40	5254.81177	
>>>	Shanghai	Power Pl	NOx	157215	45	5427.573409	
	Shanghai	Power Pl	NOx	157215	50	5600.335048	
	Shanghai	Power Pl	NOx	157215	55	7410.922236	
~~	Shanghai	Power PI	NOx	157215	60	9221.509422	
	Shanghai	Power PI	NOx	157215	65	11032.09661	
	Shanghai	Power PI	NOx	157215	70	12842.68379	
	Shanghai	Power Pl	NOx	157215	75	40584.5102	
	Shanghai	Power PI	NOx	157215	80	59764.54741	
	Shanghai	Power Pl	NOx	157215	85	78944.58462	
	Shanghai	Power Pl	NOx	157215	90	98124.62183	
	Shanghai	Power Pl	NOx	157215	95	117304.659	
	Shanghai	Power PI	NOx	157215	100	136484.6962	
	Shanghai	Power Pl	SO2	86731	5	267.3824258	
	Shanghai	Power PI	SO2	86731	10	534.7648518	
	Shanghai	Power Pl	SO2	86731	15	802.1472776	
	Shanghai	Power PI	SO2	86731	20	1069.529703	
	Shanghai	Power Pl	SO2	86731	25	1336.91213	
Back	Vext	1	1				*

Fig. 12 Selected Regions 1

ile Project Abo	ut							
		System Input	System Ou	tput				
ontrol Input File:		Regional C	ontrol&Cost	Cost Curve				
:\ICET 0.14\Data\ICET_Conf	ig_China_YRD_ex 🔯	Region	Sector	Pollutant	Current_Emission (ton)	Cost_Estimate(%)	Cost_Unit(\$/ton)	
vailable Regions:	Selected Regions:	Shanghai	Power PI	NOx	157215	5	818.2147488	
anghai angsu	Shanghai Jiangsu	Shanghai	Power Pl	NOx	157215	10	1636.429498	
ejiang	Zhejiang	Shanghai	Power PI	NOx	157215	15	2454.644246	
		Shanghai	Power Pl	NOx	157215	20	3272.858995	
		Shanghai	Power Pl	NOx	157215	25	4091.073743	
		Shanghai	Power Pl	NOx	157215	30	4909.288492	
		Shanghai	Power PI	NOx	157215	35	5082.050131	
		Shanghai	Power Pl	NOx	157215	40	5254.81177	
>>		Shanghai	Power Pl	NOx	157215	45	5427.573409	
		Shanghai	Power Pl	NOx	157215	50	5600.335048	
		Shanghai	Power PI	NOx	157215	55	7410.922236	
<<		Shanghai	Power Pl	NOx	157215	60	9221.509422	
		Shanghai	Power Pl	NOx	157215	65	11032.09661	
		Shanghai	Power Pl	NOx	157215	70	12842.68379	
		Shanghai	Power PI	NOx	157215	75	40584.5102	
		Shanghai	Power Pl	NOx	157215	80	59764.54741	
		Shanghai	Power Pl	NOx	157215	85	78944.58462	
		Shanghai	Power Pl	NOx	157215	90	98124.62183	
		Shanghai	Power PI	NOx	157215	95	117304.659	
		Shanghai	Power Pl	NOx	157215	100	136484.6962	
		Shanghai	Power Pl	SO2	86731	5	267.3824258	
		Shanghai	Power Pl	SO2	86731	10	534.7648518	
	<u></u>	Shanghai	Power PI	SO2	86731	15	802.1472776	
		Shanghai	Power Pl	SO2	86731	20	1069.529703	
		Shanghai	Power Pl	SO2	86731	25	1336.91213	
	Back Next							

Fig. 13 Selected Regions 2

Click **next** button to enter the interface of **Pollutant Control** .

Choose one region in the Selected Regions column and set emission reduction ratio

of different sectors for the selected region.

Click **Run** button and Fig. 14 will appear ,choose **yes** to run the program.



Fig. 14 Save project and run

5.3 View Result

The system will output four aspects information: **Summary Information**, **Regional Level**, **RSM Control Factor** and **Chart**. Below we will briefly introduce it.

5.3.1 Summary Information

Summary Information contains total removal cost, baseline emission and removal cost of each pollutant.

llutant control:		System Input System Output			
nanghai Jiangsu Zhejiang		Summary Information Regional Level RSM Con	trol Factor Cha	art	
PowerPlant	<u>^</u>	Total Removal Cost			
NOx Emission Reduction (%)	55.7	Total PM2.5 Removal Cost (Million RMB)			2,280.8
		Total NOx Removal Cost (Million RMB)			7,997.6
SO2 Emission Reduction (%)	31.4	Total SO2 Removal Cost (Million RMB)			2,630.4
PM25 Emission Peduction (%)	20.1	Iotal VUC Removal Cost (Million RMB)			0
rwizo cimosion Reduction (%)	20.1	Total NH3 Removal Cost (Million RMB)			0
Domestic		PM25 Emission			
NOx Emission Reduction (%)	29.7	Baseline PM2.5 Emission (Thousand Ton)	660.4	PM2.5 COST per TON (Yuan/Ton)	10,295.1
CO3 Emission Reduction (P1)		PM2.5 Emission Removed (Thousand Ton)	221.5	PM2.5 Emission Removed (%)	33.5
SOZ EMISSION REDUCTION (76)	48.5	NOx Emission			
		Baseline NOx Emission (Thousand Ton)	1.977.6	NOx COST per TON (Yuan/Ton)	9.113.3
PM25 Emission Reduction (%)	19.6				-,
Transport		NOx Emission Removed (Thousand Ton)	877.6	NOx Emission Removed (%)	44.4
NOx Emission Reduction (%)	43. 7	SO2 Emission			
		Baseline SO2 Emission (Thousand Ton)	1,550.2	SO2 COST per TON (Yuan/Ton)	5,247.0
SO2 Emission Reduction (%)	48.5	SO2 Emission Removed (Thousand Ton)	501.3	SO2 Emission Removed (%)	32.3
		VOC Emission			
PM25 Emission Reduction (%)	65.5	Baseline VOC Emission (Thousand Ton)	0	VOC COST per TON (Yuan/Ton)	0
Industry		VOC Emission Removed (Thousand Tors)	0	VOC Emission Removed (%)	0
NOx Emission Reduction (%)	29.7	NH3 Emission	3		v
	*	Baseline NH3 Emission (Thousand Ton)	0	NH3 COST per TON (Yuan/Ton)	0
-		NH3 Emission Removed (Thousand Top)	0	NH2 Emission Demound (9/)	

Fig. 15 Summary Information

5.3.2 Regional Level

>The result of **regional level** are listed in the following table, it summarizes baseline emission, control cost, removed emission and remained emission of selected regions.

File Project About								
Pollutant control:			System Input	System Outp	out			
Shanghai Jiangsu Zhejiang			Summary Ir	formation R	egional Level RSM Control Fa	ctor Chart		
PowerPlant		*	Region	Pollutant	Baseline_Emission(Ton)	Control_Cost(RMB)	Removed_Emission(Ton)	Remaine
NOx Emission Reduction (%)	55.7		Shanghai	NOx	379,192.9	1,211,557,047.4	168,380.3	210,812.6
			Shanghai	SO2	238,898.6	732,138,939.5	101,034.8	137,863.8
000 5 - 1 - 1 - D - 4			Shanghai	PM25	66,079.9	245,201,207.1	16,301.5	49,778.4
SO2 Emission Reduction (%)	31.4		Jiangsu	NOx	837,795.3	2,878,200,652.7	351,995.7	485,799.6
			Jiangsu	SO2	767,395.2	1,127,241,957.1	246,484.1	520,911.2
PM25 Emission Reduction (%)	20.1		Jiangsu	PM25	417,134.7	1,321,599,958.4	153,234.4	263,900.3
Domestic			Zhejiang	NOx	760,608.4	3,907,830,596.6	357,200.0	403,408.4
NOx Emission Reduction (%)	29.7	E	Zhejiang	SO2	543,954.1	771,050,825.9	153,803.5	390,150.6
			Zhejiang	PM25	177,158.5	714,045,662.2	52,011.4	125,147.1
SO2 Emission Reduction (%)	48.5							
	10.0							
Iransport								
NOX Emission Reduction (%)	43.7							
SO2 Emission Reduction (%)	48.5							
PM25 Emission Reduction (%)	65.5							
Industry								
NOx Emission Reduction (%)	29.7	Ŧ						
			•		m			

Fig. 16 Regional Level

5.3.3 Emission Factor

Each **emission factor** of selected regions are listed in the below table, users can click

Output RSM Control Factors button to export the current results for further study.

rş.									
Ilutant control:			System Input	System Output					
hanghai Jiangsu Zhejiang			Summary Info	rmation Regiona	I Level RSM Contro	ol Factor Chart			
PowerPlant		*	Region	Pollutant	Source	Limit	Min	Max	
NOx Emission Reduction (%)	EE 7		Shanghai	NOx	PowerPlant	0.44	0	1.5	
tox cimportin reduction (xy	55.1		Shanghai	SO2	PowerPlant	0.69	0	1.5	
			Shanghai	PM25	PowerPlant	0.80	0	1.5	
3O2 Emission Reduction (%)	31.4		Shanghai	NOx	Domestic	0.70	0	1.5	
			Shanghai	SO2	Domestic	0.52	0	1.5	
PM25 Emission Reduction (%)	20.1		Shanghai	PM25	Domestic	0.80	0	1.5	
Domestic			Shanghai	NOx	Transport	0.56	0	1.5	
NOx Emission Reduction (%)	29.7	=	Shanghai	SO2	Transport	0.52	0	1.5	
	20.1		Shanghai	PM25	Transport	0.35	0	1.5	
			Shanghai	NOx	Industry	0.70	0	1.5	
SO2 Emission Reduction (%)	48.5		Shanghai	SO2	Industry	0.52	0	1.5	
			Shanghai	PM25	Industry	0.80	0	1.5	
PM25 Emission Reduction (%)	19.6		Shanghai	NOx	Area	0.56	0	1.5	
Transport			Shanghai	SO2	Area	0.52	0	1.5	1
NOx Emission Reduction (%)	43.7		Shanghai	PM25	Area	0.35	0	1.5	
			Jiangsu	NOx	PowerPlant	0.32	0	1.5	1
			Jiangsu	SO2	PowerPlant	0.59	0	1.5	
SO2 Emission Reduction (%)	48.5		Jiangsu	PM25	PowerPlant	0.62	0	1.5	1
			Jiangsu	NOx	Domestic	0.69	0	1.5	
PM25 Emission Reduction (%)	65.5		Jiangsu	SO2	Domestic	0.75	0	1.5	
Industry			Jiangsu	PM25	Domestic	0.65	0	1.5	
NOx Emission Reduction (%)	29.7		Jiangsu	NOx	Transport	0.69	0	1.5	1
			Jiangsu	SO2	Transport	0.75	0	1.5	
		-		DMADE	T	0.20	0	4.5	1

Fig. 17 RSM Control Factor

In the following figure (Fig. 18), we can see a mapping factors file that marked in a red square, the details of the file is displayed in Fig. 19. This file is used to link the Region, Pollutant, Source in ICET with RSM. For example, **Shanghai** was used in ICET while RSM used **SH** instead. To correspond with RSM, the file that defines the relationship between ICET and RSM is need.

<u>-</u>									
14	1		System Input	System Output					
hanghai luanan atailana			Summany Info	rmation Persiona	BSM Contro	Eactor Chart	12		
nanghar Jiangsu Zhejiang			Persion	Pollutant	Source	Limit	Min	Max	-
PowerPlant			Shanghai	NOx	PowerPlant	0.44	0	1.5	
NOx Emission Reduction (%)	55.7		Shanghai	502	PowerPlant	0.69	0	15	
			Shanghai	PM25	PowerPlant	0.80	0	15	-
SO2 Emission Reduction (%)	31.4		Shanghai	NOx	Domestic	0.70	0	1.5	-
			Shanghai	SO2	Domestic	0.52	0	1.5	-
PM25 Emission Reduction (%)			Shanghai	PM25	Domestic	0.80	0	1.5	
Demestic			Shanghai	NOx	Transport	0.56	0	1.5	
NOx Emission Reduction (%)	29.7	=	Shanghai	SO2	Transport	0.52	0	1.5	-
			Shanghai	PM25	Transport	0.35	0	1.5	-
SO2 Emission Reduction (%)	48.5		Shanghai	NOx	Industry	0.70	0	1.5	-
			Shanghai	SO2	Industry	0.52	0	1.5	-
			Shanghai	PM25	Industry	0.80	0	1.5	-
PM25 Emission Reduction (%)	19.6		Shanghai	NOx	Area	0.56	0	1.5	
Transport			Shanghai SO2	Area	0.52	0	1.5		
NOx Emission Reduction (%)	42.7		Shanghai	PM25	Area	0.35	0	1.5	
Nox Emission neuderon (n)	45.1		Jiangsu	NOx	PowerPlant	0.32	0	1.5	-
			Jiangsu	SO2	PowerPlant	0.59	0	1.5	-
SO2 Emission Reduction (%)	48.5		Jiangsu	PM25	PowerPlant	0.62	0	1.5	-
			Jiangsu	NOx	Domestic	0.69	0	1.5	
PM25 Emission Reduction (%)	65.5		Jiangsu	SO2	Domestic	0.75	0	1.5	-
Industry			Jiangsu	PM25	Domestic	0.65	0	1.5	
NOx Emission Reduction (%)	29.7		Jiangsu	NOx	Transport	0.69	0	1.5	
	-	-	Jiangsu	SO2	Transport	0.75	0	1.5	
			Lineart	DMADE	T	0.20	0	4.5	7

Fig. 18 Mapping Factors

A B		С	D	E	F	G
<u>Cost Regi</u>	RSM_Regio	Cost_Sect	RSM_Secto	Cost_Poll	RSM_Pollu	itant
Shanghai	SH	Power Pla	PP	NOx	NOx	
Jiangsu	JS	Industry	IN&DO	PM25	PM25	
Zhejiang	ZJ	Domestic	IN&DO	S02	S02	
Other	OTH	Transport	TR	NH3	NH3	
		Area	TR	VOC	VOC	
				PMC	PMC	

Fig. 19 Mapping Factors

5.3.4 Cost Curve

From Fig. 20, we can see emissions comparison of different pollutants between baseline and control.



Fig. 20 Chart of Emission

>Fig. 21 displays control cost comparison of different regions in different pollutants.



Fig. 21 Chart of Control Cost