



23TH INTERNATIONAL CLEAN AIR AND ENVIRONMENT CONFERENCE

16 - 18 SEPTEMBER 2019

INSTITUT ALAM SEKITAR MALAYSIA



For more information,
please scan me!



Program : 23th International Clean Air and Environment Conference

Tarikh : 16 - 18 September 2019

Lokasi : Hotel Rydes Lakeland Resort, Queenstown,

Penganjur : The Clean Air Society of Australia and New Zealand (CASANZ)

- Lebih 200 orang
- pegawai alam sekitar, perunding, pensyarah, NGO, pelajar universiti
- USEPA, UK Authority, AUSEPA, NZ Authority, penyelidik university / institut, perunding, rekabentuk teknologi dan juga NGO



TOPIK PEMBENTANGAN INSTITUT ALAM SEKITAR MALAYSIA

1

Sistem Atas Talian
Pembakaran Kecil Pekebun

2

Kawalan Kebakaran Hutan

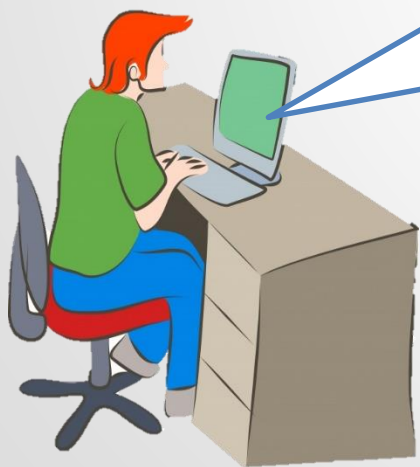
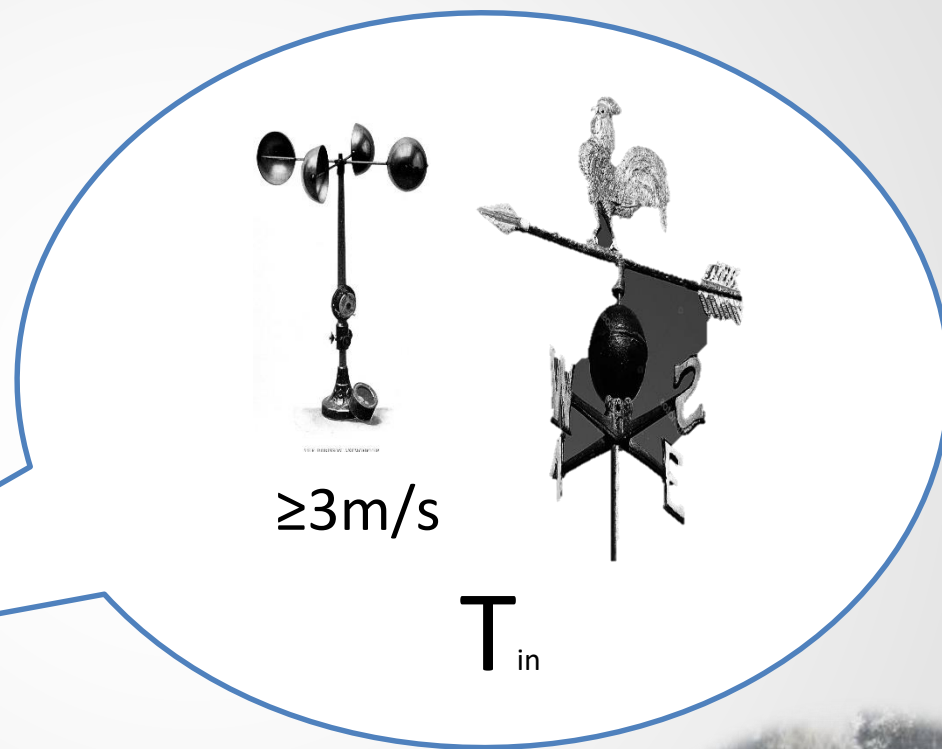
3

Pemodelan Kualiti Udara
- Application

4

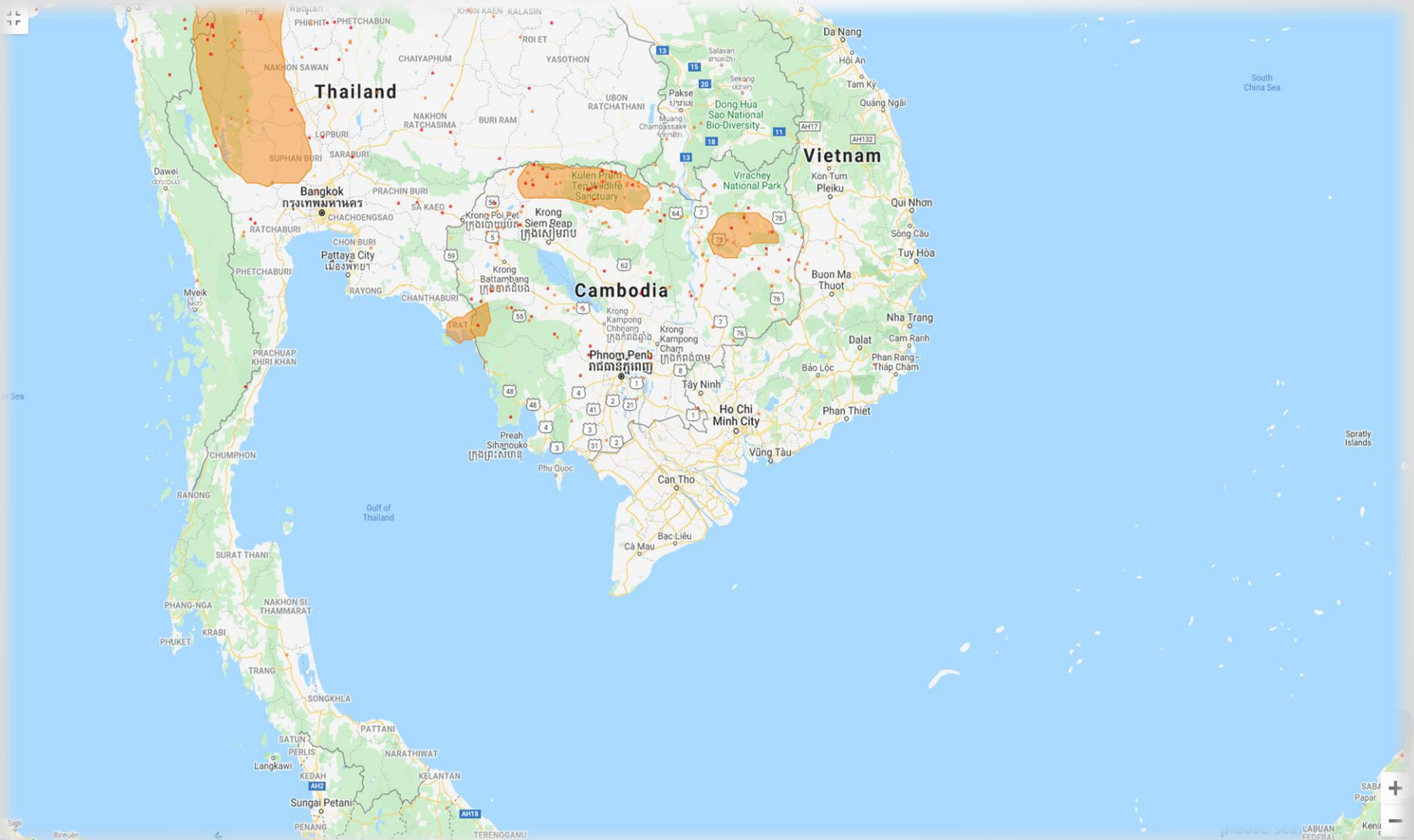
Pengawasan Kualiti Udara
- Low Cost Sensor

SISTEM ATAS TALIAN PEMBAKARAN TERBUKA BAGI PEKEBUN KECIL INSTITUT ALAM SEKITAR MALAYSIA



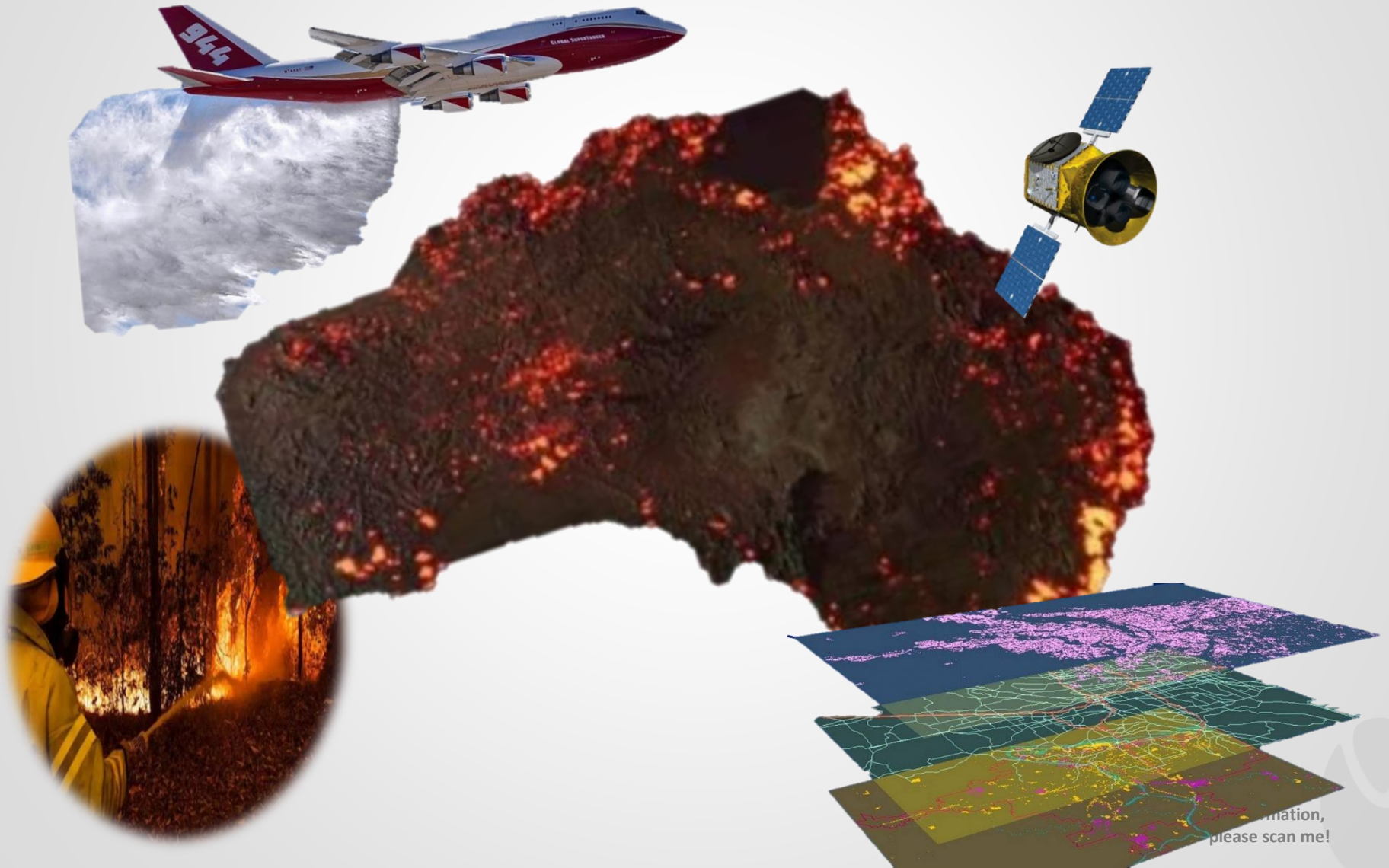
KAWALAN PEMBAKARAN TERBUKA DI AUSTRALIA

INSTITUT ALAM SEKITAR MALAYSIA



KAWALAN PEMBAKARAN TERBUKA DI AUSTRALIA

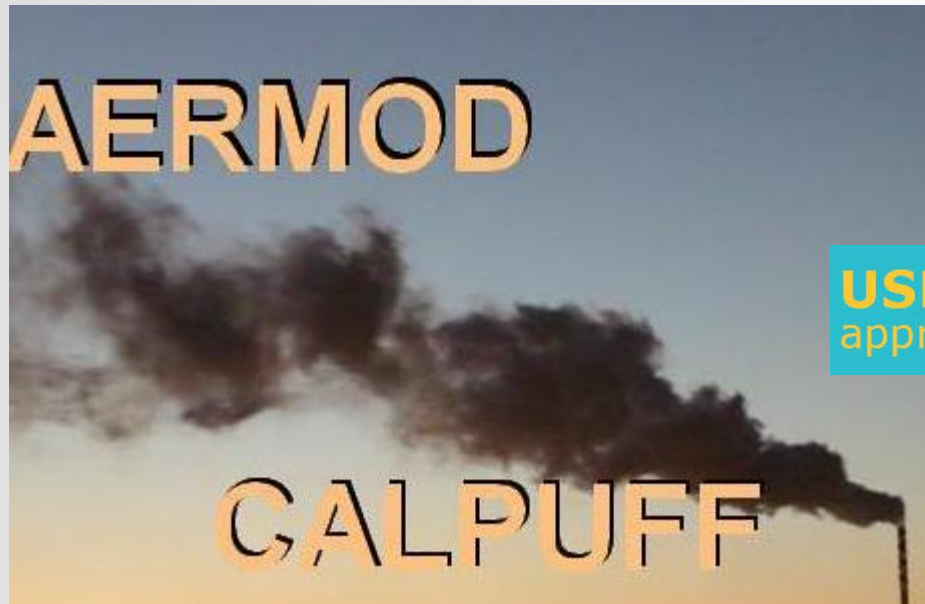
INSTITUT ALAM SEKITAR MALAYSIA



PEMODELAN KUALITI UDARA

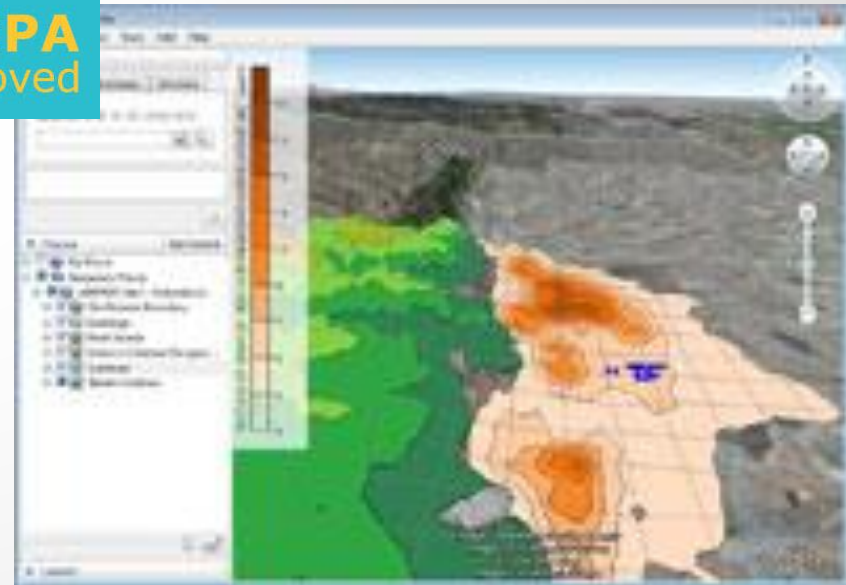
- APPLICATION

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air dispersion model for
regulatory assessment

USEPA
approved



predict
ground level
concentration

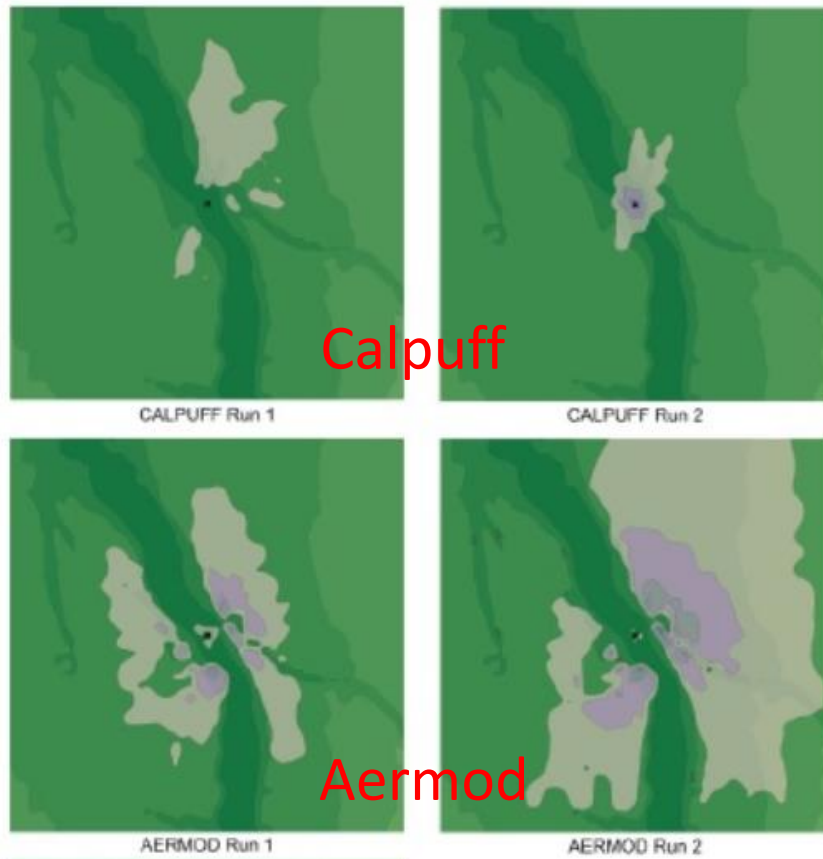
2017 - USEPA removed CALPUFF but
still relevant ?

PEMODELAN KUALITI UDARA


- APPLICATION

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same source, emission rate, terrain
valley & meteorological



CALPUFF
A multi-layer, multi-species non-steady-state puff dispersion model




AERMOD
Model air quality impacts due to industry emissions for permitting and planning purposes



AERSCREEN
A screening model based on the U.S. EPA AERMOD air quality dispersion model



SCREEN3
Air dispersion screening tool used to analyze multiple sources



AERMET
Process meteorological data for input into the BREEZE AERMOD dispersion model



ROADS
Air dispersion modeling suite that predicts air quality impacts from moving and idling motor vehicles

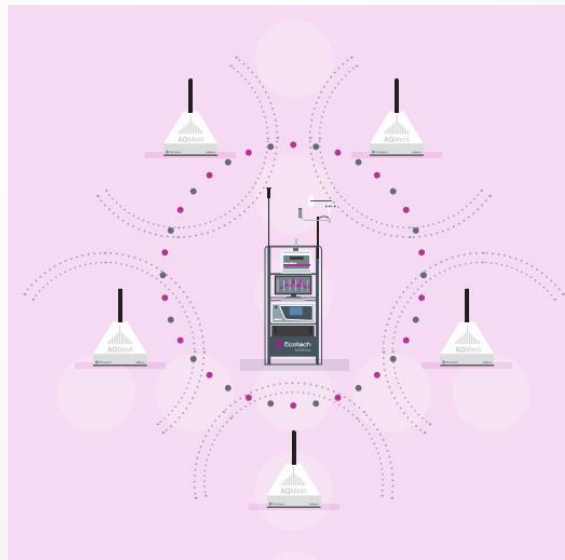


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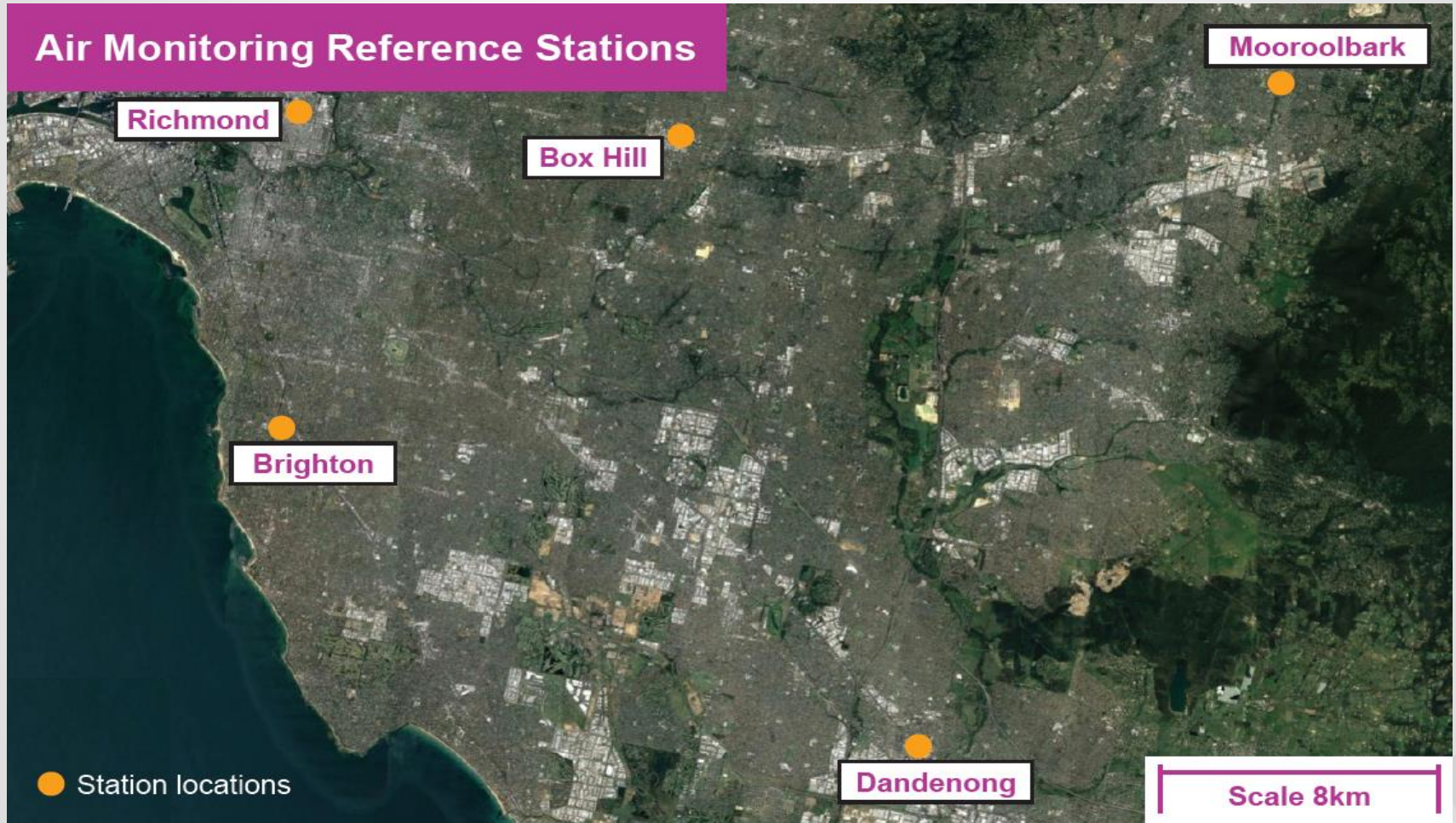
PENGAWASAN KUALITI UDARA - LOW COST SENSOR INSTITUT ALAM SEKITAR MALAYSIA

Experience of global small sensor co-location comparison studies with AQMesh

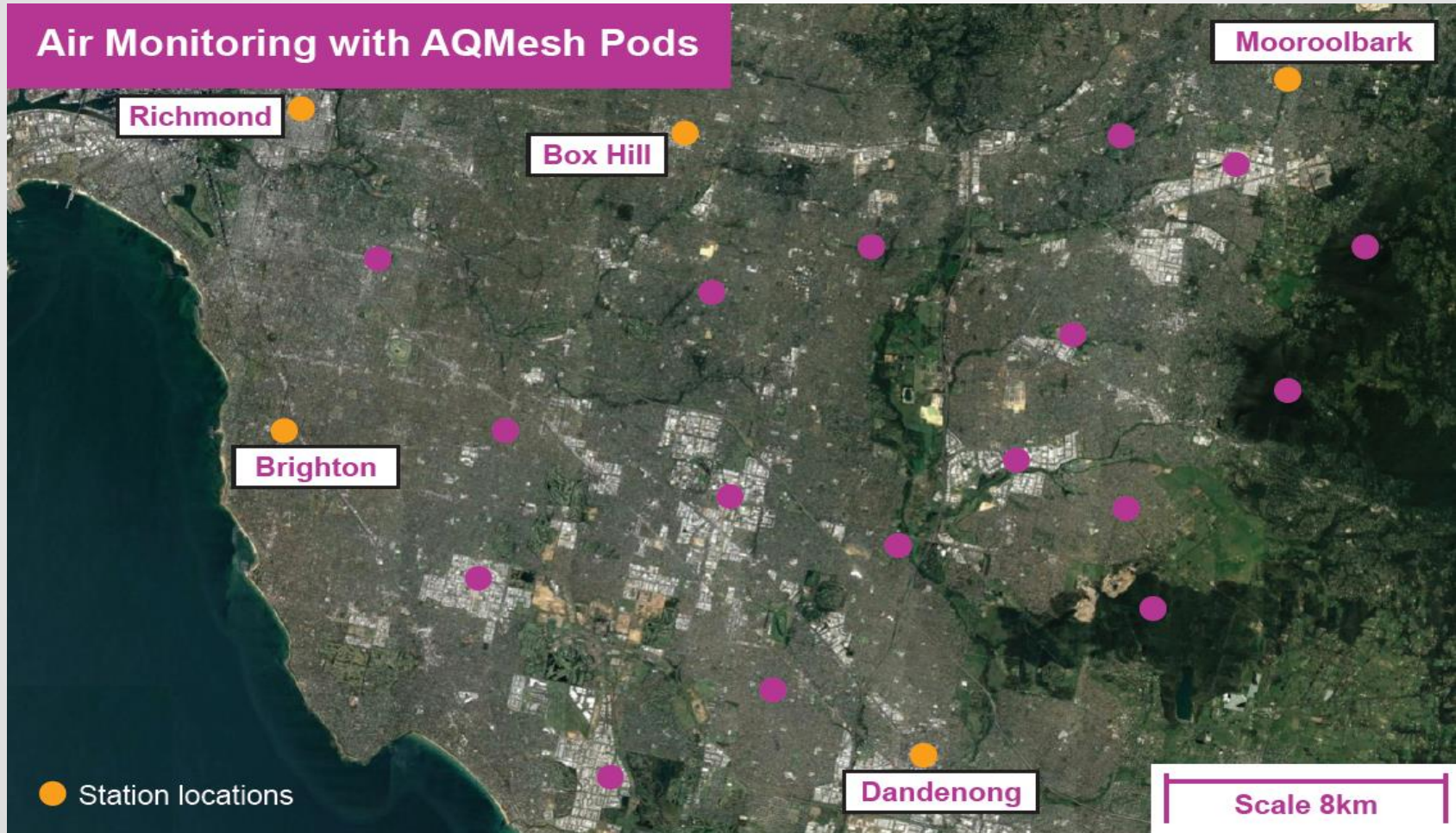
NO ₂	NO _x	SO ₂	H ₂ S
O ₃	PM _{2.5}	PM ₁	TPC
NO	CO ₂	☞	RH%
CO	PM ₁₀	AP	T



PENGAWASAN KUALITI UDARA - LOW COST SENSOR INSTITUT ALAM SEKITAR MALAYSIA



PENGAWASAN KUALITI UDARA - LOW COST SENSOR INSTITUT ALAM SEKITAR MALAYSIA

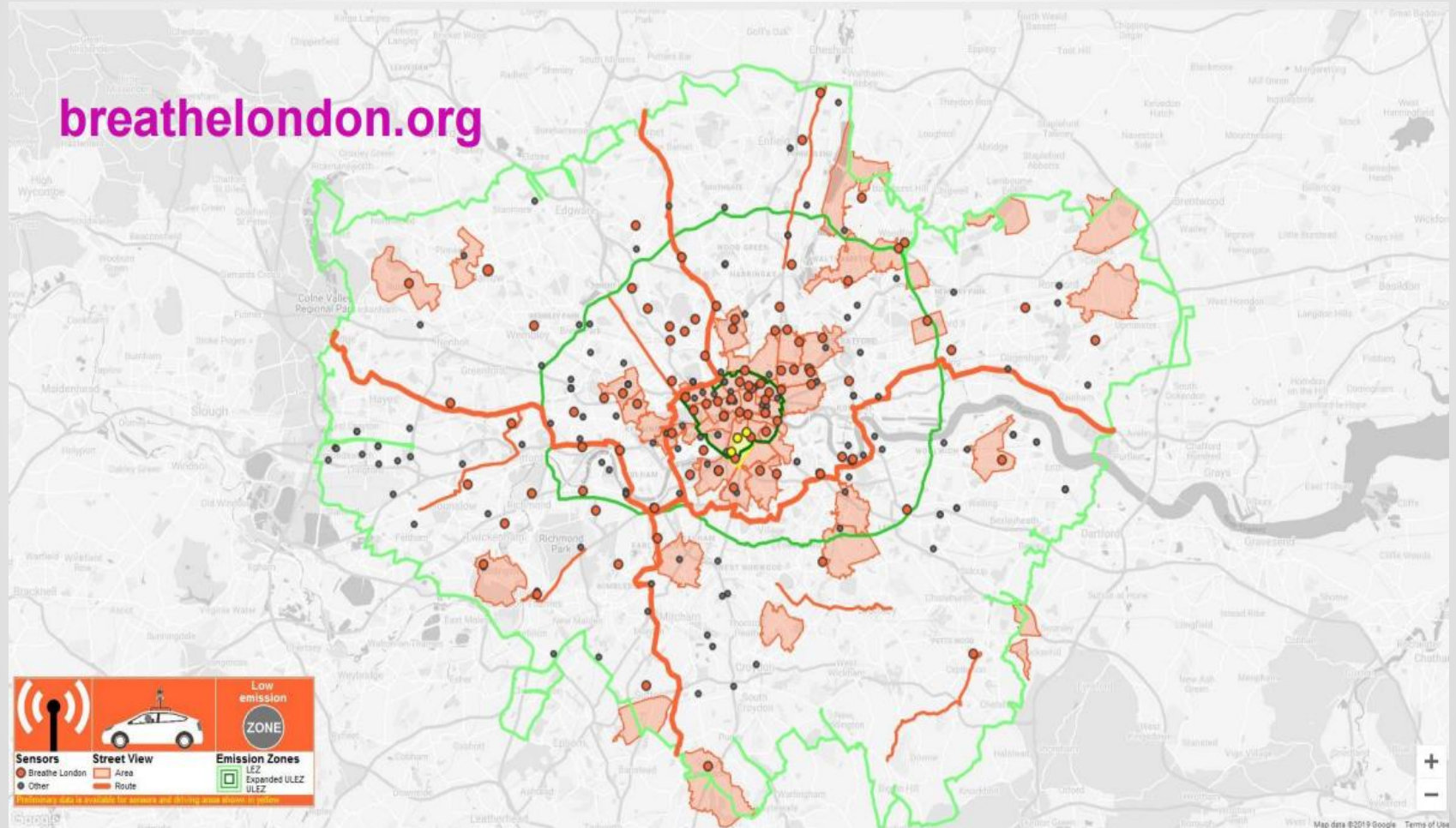


PENGAWASAN KUALITI UDARA - LOW COST SENSOR INSTITUT ALAM SEKITAR MALAYSIA



For more information,
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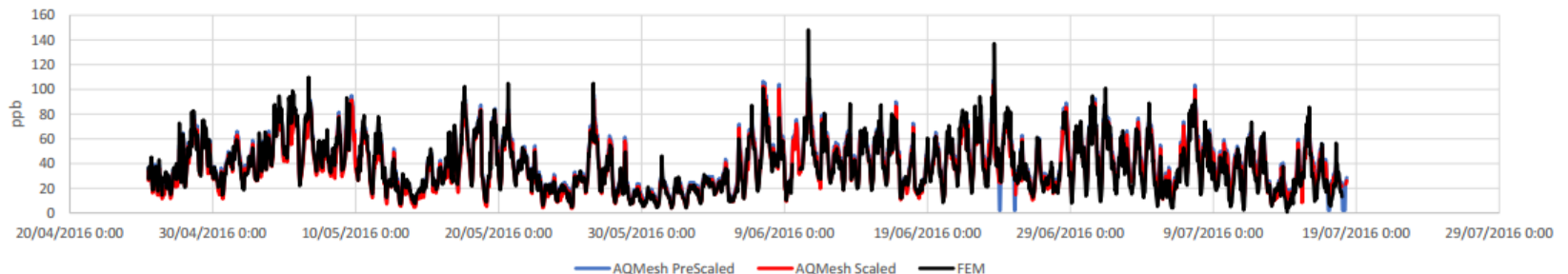
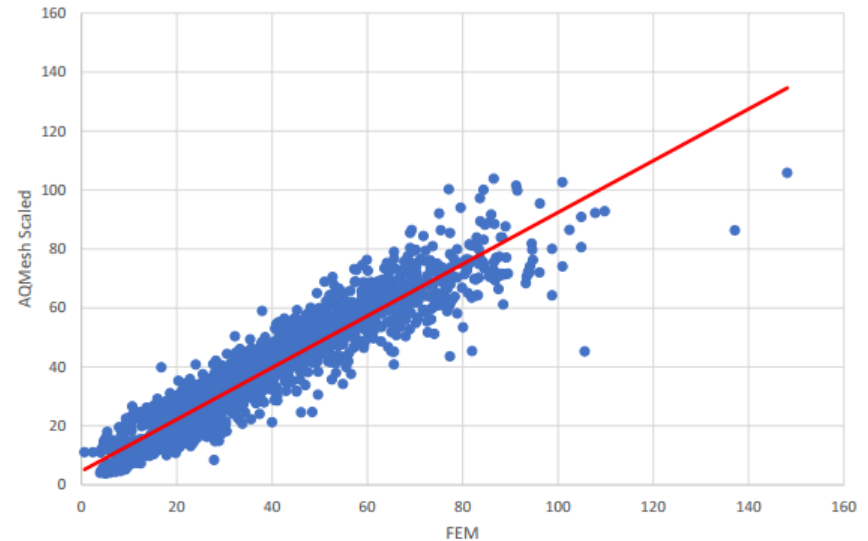
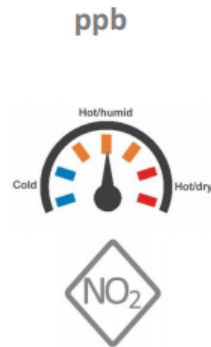
PENGAWASAN KUALITI UDARA - LOW COST SENSOR INSTITUT ALAM SEKITAR MALAYSIA



PENGAWASAN KUALITI UDARA - LOW COST SENSOR INSTITUT ALAM SEKITAR MALAYSIA

AQMesh results – NO₂

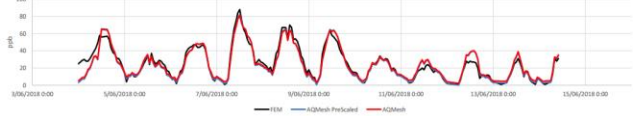
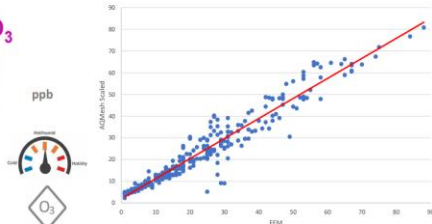
R ²	0.89	
Accuracy (MAE)	PreScaled	Scaled
	4.50	5.09
Accuracy (RMSE)	PreScaled	Scaled
	6.17	7.14
Averaging interval	60 minute	
Conditions	Hot, humid	
Region	London, UK	
Location	Urban roadside	
Date	Apr – Jul 2016	
Processing version	v4.2.3	



PENGAWASAN KUALITI UDARA - LOW COST SENSOR INSTITUT ALAM SEKITAR MALAYSIA

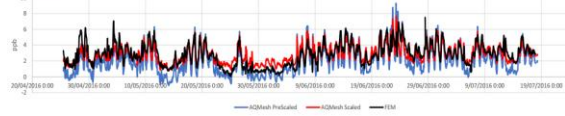
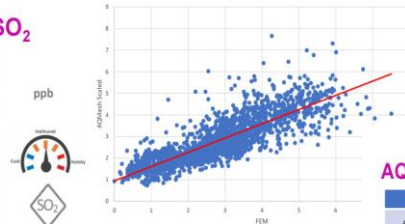
AQMesh results – O₃

R ²	0.92	
Accuracy (MAE)	PreScaled 3.71	Scaled 3.70
Accuracy (RMSE)	PreScaled 5.22	Scaled 5.04
Averaging interval	60 minute	
Conditions	Hot, humid	
Region	Southern USA	
Location	Industrial	
Date	June 2018	
Processing version	v4.2.3	



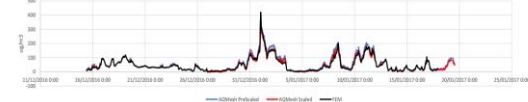
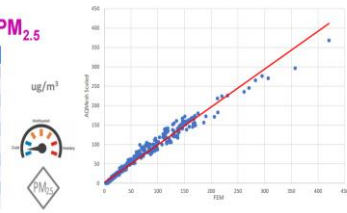
AQMesh results – SO₂

R ²	0.70	
Accuracy (MAE)	PreScaled 1.37	Scaled 0.57
Accuracy (RMSE)	PreScaled 1.51	Scaled 0.83
Averaging interval	60 minute	
Conditions	Hot, humid	
Region	London, UK	
Location	Urban roadside	
Date	Apr – Jul 2016	
Processing version	v4.2.3	



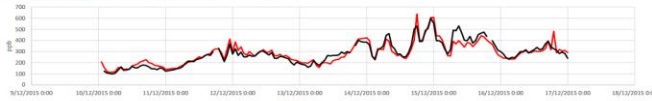
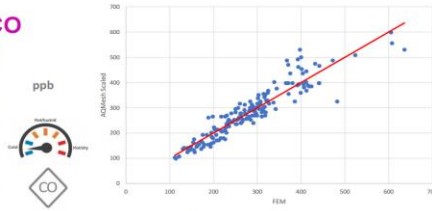
AQMesh results – PM_{2.5}

R ²	0.98	
Accuracy (MAE)	PreScaled 33.80	Scaled 32.57
Accuracy (RMSE)	PreScaled 43.10	Scaled 42.50
Averaging interval	60 minute	
Conditions	Cold	
Region	Eastern Europe	
Location	Urban background	
Date	Dec 2016 – Jan 2017	
Processing version	v2.5	



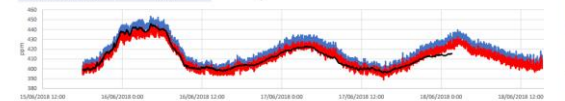
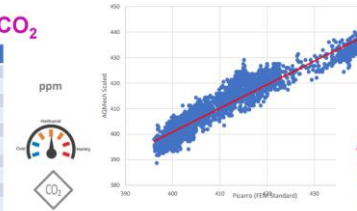
AQMesh results – CO

R ²	0.87	
Accuracy (MAE)	PreScaled 335.25	Scaled 27.25
Accuracy (RMSE)	PreScaled 349.30	Scaled 37.01
Averaging interval	60 minute	
Conditions	Cold	
Region	Western Europe	
Location	Urban	
Date	December 2015	
Processing version	v4.2.3	



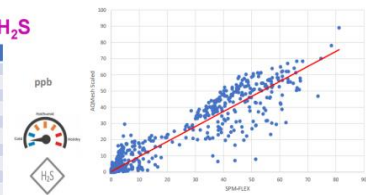
AQMesh results – CO₂

R ²	0.93	
Accuracy (MAE)	PreScaled 3.96	Scaled 2.39
Accuracy (RMSE)	PreScaled 4.66	Scaled 2.93
Averaging interval	1 minute	
Conditions	Hot, variate humidity	
Region	Western Europe	
Location	Cambridge, UK	
Date	June 2016	
Processing version	v4.2.3	



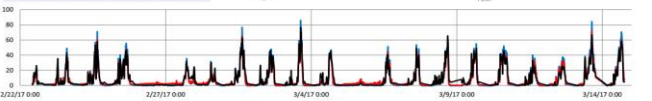
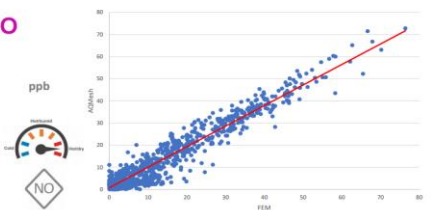
AQMesh results – H₂S

R ²	0.93	
Accuracy (MAE)	PreScaled 1.26	Scaled 1.27
Accuracy (RMSE)	PreScaled 3.62	Scaled 3.87
Averaging interval	60 minutes	
Conditions	Cold	
Region	United Kingdom	
Location	Wastewater treatment	
Date	May 2017 – Sep 2017	
Processing version	v4.2.3	



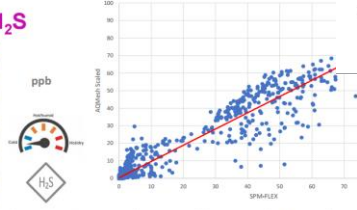
AQMesh results – NO

R ²	0.91	
Accuracy (MAE)	PreScaled 2.63	Scaled 2.16
Accuracy (RMSE)	PreScaled 3.80	Scaled 3.02
Averaging interval	15 minute	
Conditions	Hot, dry, desert	
Region	Southern California, US	
Location	Roadside	
Date	Feb 2017 – Apr 2017	
Processing version	v5.0	



AQMesh results – H₂S

R ²	0.93	
Accuracy (MAE)	PreScaled 1.26	Scaled 1.27
Accuracy (RMSE)	PreScaled 3.62	Scaled 3.87
Averaging interval	60 minutes	
Conditions	Cold	
Region	United Kingdom	
Location	Wastewater treatment	
Date	May 2017 – Sep 2017	
Processing version	v4.2.3	



PENGAWASAN KUALITI UDARA - LOW COST SENSOR INSTITUT ALAM SEKITAR MALAYSIA

Australia

Austria

Azerbaijan

Bangladesh

Belgium

Bolivia

Brazil

Canada

China

Czech Republic

Finland

France

Germany

Indonesia

Ireland

Israel

Italy

Malta

Mozambique

Myanmar

Netherlands

Nicaragua

Norway

Rwanda

Saudi Arabia

Serbia

Singapore

Slovakia

Slovenia

South Africa

Spain

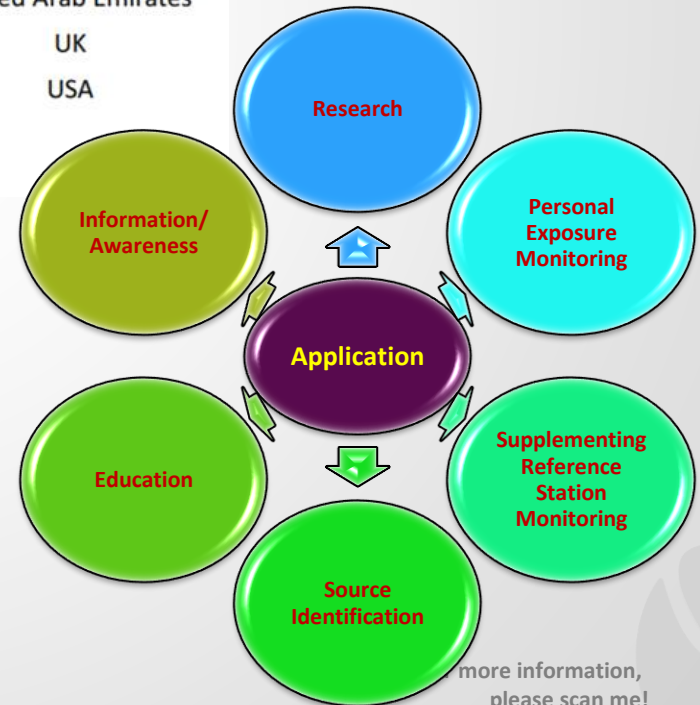
Sweden

Trinidad

United Arab Emirates

UK

USA



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23TH INTERNATIONAL CLEAN AIR AND ENVIRONMENT CONFERENCE INSTITUT ALAM SEKITAR MALAYSIA



SEKIAN, TERIMA KASIH