Supporting Information

Dramatic increase of reactive VOC emission from ships at berth after implementing the fuel switch policy in the Pearl River Delta Emission Control Area

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Table S1. The percentage of the top 25 VOC species in EFs.

Species (before IFSP[e])	Coastal vessels Mean ±95% C.I.	Species (after IFSP)	Coastal vessels Mean ±95% C.I.	Species	River vessels Mean ±95% C.I.
n-Hexane	**0.67 ±0.25**	**Ethane**	**1.16 ±0.50**	**Ethane**	**0.94 ±0.30**
n-Octane	**0.60 ±0.15**	**Propane**	**0.81 ±0.39**	**n-Butane**	**1.18 ±2.25**
n-Nonane	**2.74 ±1.65**	**n-Butane**	**2.59 ±2.89**	**n-Octane**	**0.60 ±0.27**
n-Decane	**7.40 ±6.48**	**n-Pentane**	**0.61 ±0.61**	**n-Nonane**	**2.57 ±1.12**
n-Undecane	**16.20 ±10.34**	**n-Nonane**	**2.37 ±2.57**	**n-Decane**	**4.15 ±1.95**
n-Dodecane	**15.78 ±9.90**	**n-Decane**	**6.27 ±6.87**	**n-Undecane**	**2.93 ±1.38**
Isopentane	**1.61 ±0.69**	**n-Undecane**	**2.61 ±2.92**	**Isobutane**	**15.99 ±5.25**
3-Methylhexane	**0.79 ±0.41**	**n-Dodecane**	**2.90 ±5.59**	**Isopentane**	**1.96 ±0.51**
TM224PE[a]	**2.30 ±1.16**	**Isobutane**	**8.47 ±3.68**	**3-Methylhexane**	**0.61 ±0.20**
Ethylene	**2.85 ±1.50**	**Isopentane**	**1.65 ±0.82**	**TM224PE[a]**	**0.82 ±0.24**
Propene	**5.36 ±2.34**	**Ethylene**	**23.88 ±11.66**	**Ethylene**	**23.85 ±7.17**
1-Butene	**1.90 ±1.11**	**Propene**	**10.89 ±2.94**	**Propene**	**12.38 ±3.51**
Trans-2-butene	**0.51 ±0.26**	**1-Butene**	**2.64 ±0.69**	**1-Butene**	**2.30 ±0.17**
1-Pentene	**2.66 ±1.83**	**1-Pentene**	**1.63 ±0.40**	**1-Pentene**	**1.90 ±0.17**
1-Hexene	**5.88 ±5.01**	**1-Hexene**	**1.09 ±0.37**	**1-Hexene**	**1.58 ±0.31**
M4PE1ENE[b]	**0.64 ±0.38**	**Acetylene**	**7.87 ±10.50**	**Acetylene**	**6.90 ±2.99**
Acetylene	**0.85 ±0.55**	**Benzene**	**3.82 ±2.92**	**Benzene**	**3.04 ±0.32**
Benzene	**13.24 ±11.47**	**Toluene**	**2.10 ±1.28**	**Toluene**	**1.74 ±0.18**
Toluene	**5.91 ±2.92**	**Ethylbenzene**	**0.67 ±0.31**	**Ethylbenzene**	**0.66 ±0.25**
Ethylbenzene	**1.29 ±0.27**	**m/p-Xylene**	**1.93 ±1.03**	**m/p-Xylene**	**1.34 ±0.59**
m/p-Xylene	**1.80 ±0.25**	**o-Xylene**	**0.97 ±0.55**	**o-Xylene**	**0.73 ±0.31**
o-Xylene	**0.70 ±0.12**	**m-Ethyltoluene**	**1.09 ±0.99**	**m-Ethyltoluene**	**1.27 ±0.68**
m-Ethyltoluene	**0.54 ±0.21**	**o-Ethyltoluene**	**0.68 ±0.64**	**o-Ethyltoluene**	**0.60 ±0.25**
TM123B[c]	**0.91 ±0.38**	**TM123B**	**0.86 ±0.82**	**TM123B**	**0.81 ±0.41**
TM124B[d]	**1.47 ±1.05**	**TM124B**	**1.79 ±1.79**	**TM124B**	**1.94 ±0.84**

[a]2,2,4-Trimethylpentane; [b]4-Methyl-1-pentene; [c]1,2,3-Trimethylbenzene; [d]1,2,4-Trimethylbenzene; [e]implementing the fuel switch policy.

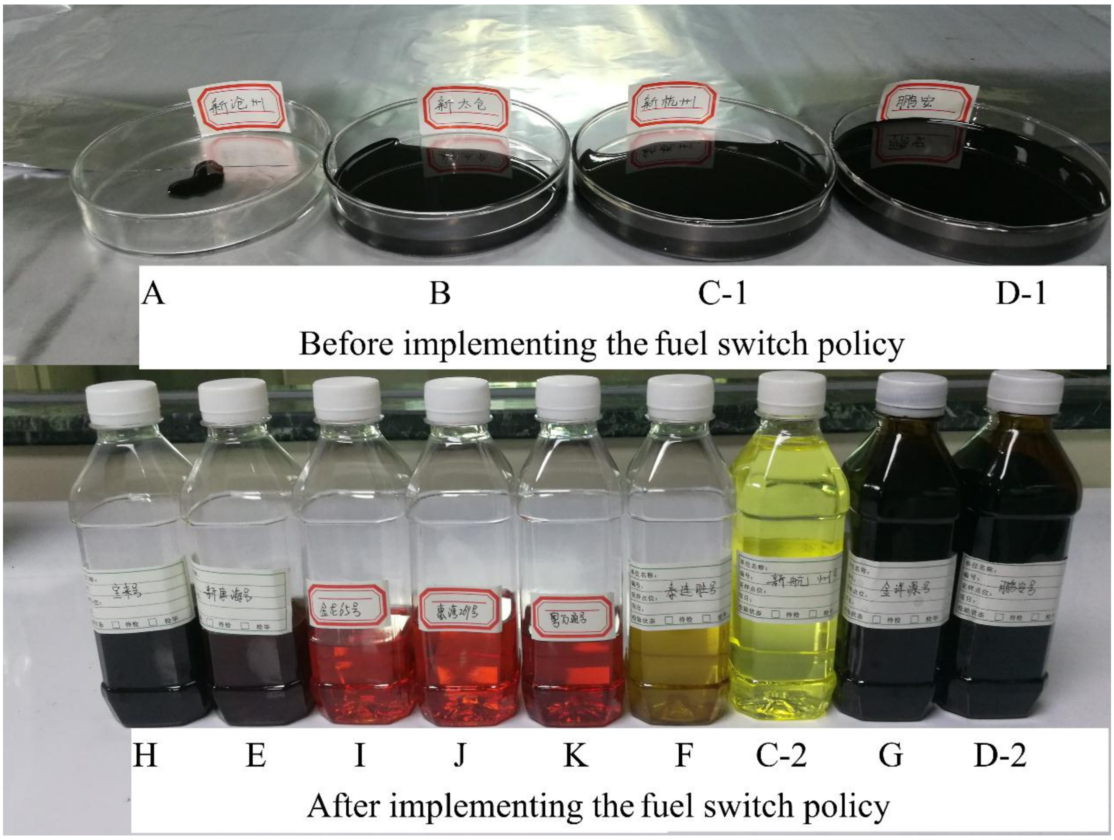


Figure S1. The fuels used by ship at berth.

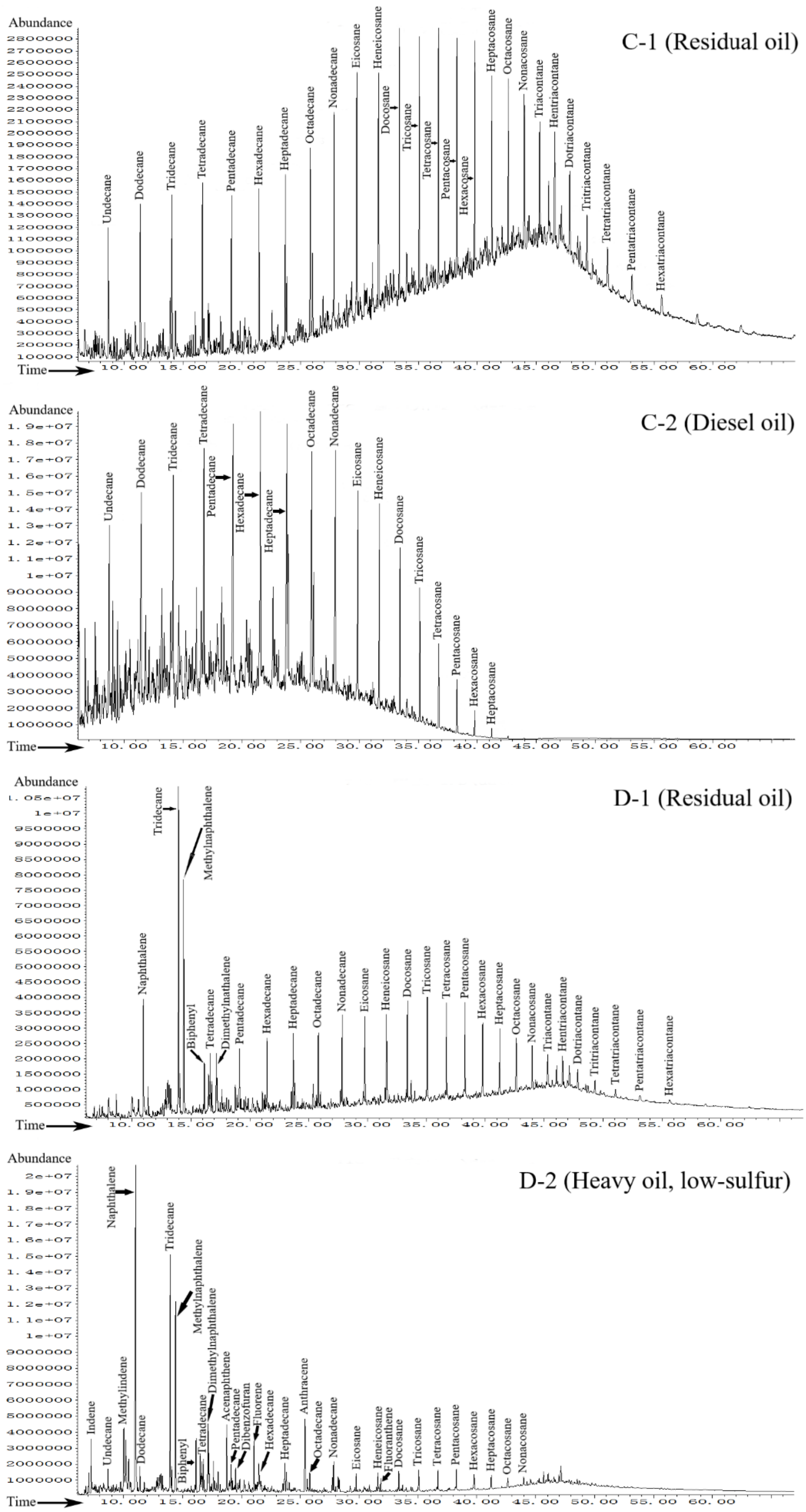
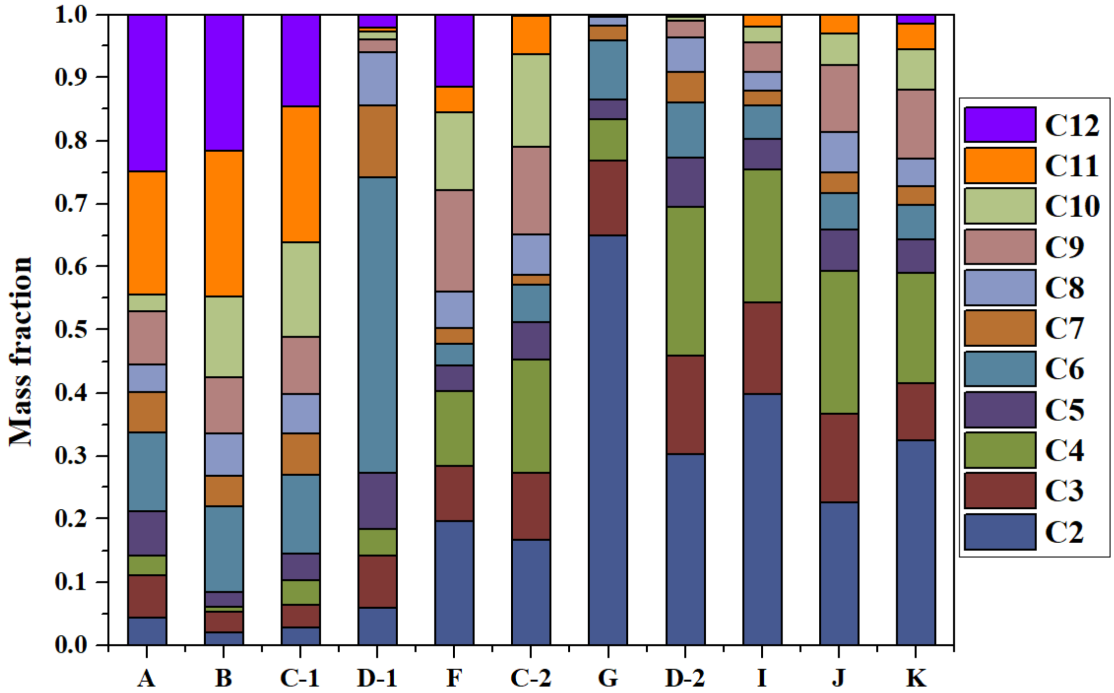


Figure S2. Typical total ion chromatographs of VOC species in fuel oils.

26 

27 Figure S3. VOCs grouping according to their carbon numbers.

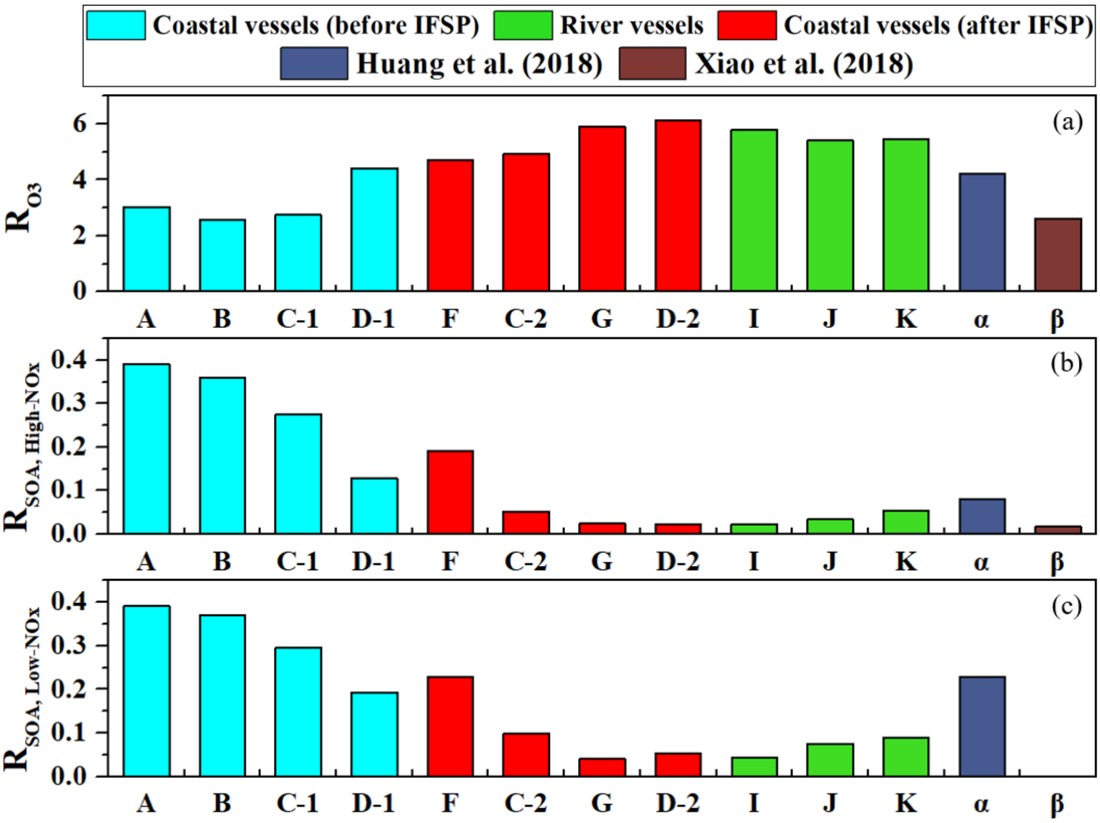


Figure S4. Comparison of R_{O3} (g O_3 g^{-1} VOCs) and R_{SOA} (g SOA g^{-1} VOCs) based on VOCs source profiles with calculated results from previous studies (IFSP: implementing the fuel switch policy).

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