Supporting Information

Table S1. Information about the ports. Chinese ports are city-based, i.e., a cluster of ports within a city. Subject to the limitation of data accuracy in the plan, we assume the core port area of the city port as the representative in order to simplify the calculation. Information about the core port area and throughput is taken from the plan [1].

Port	Port Throughput	Unit: 10^4 t	
	2019	2035	2050
Jiujiang	15117	27100	30300
Nanchang	3827	8800	11300
Ganzhou	220	3850	5000
Ji’an	280	1800	2500
Yichun	227	3600	4100
Yingtan	30	1400	1820
Shangrao	610	3650	4700
Xinyu	20	2470	3180
Jingdezhen	80	1500	2020
Fuzhou	60	780	1100
Pingxiang	0	450	680
Total	20471	55400	66700

Table S2. Information about the waterways. The capacity, length, and navigability level of the waterway are derived from the plan [1]. The engineering parameters corresponding to the waterway navigability level can be found in the standard [2-4]. D represents the level of deep waterways, i.e. better navigability than level I. It is worth noting that the Changjiang waterway and the Yangtze River waterway (with the same Chinese pronunciation) are not the same one; Changjiang is a tributary waterway of Raohe, and the Yangtze River is China's golden waterway.

Waterway	Length Unit: km	Capacity Unit: 10^4 t			Navigability level		
		2019	2035	2050	2019	2035	2050
Xinjiang	231	720	4390	7250	III~VII	III	II
Ganjiang	606	7754	23800	24500	II~VI	D~I	D~I
Yuanhe	108	20	2470	3180	VII	III	II
Changjiang	82	220	1600	1900	V	III~V	II
Leanhe	46	40	890	1150	VI	III	II
Fuhe	170	60	780	1100	VII	VII	III
Xiuhe	35	10	380	550	VI	III	II
Ganjiangdonghe	87	50	1800	2500	IV	III	III
Xinjiangxidahe	55	40	1000	1500	VII	III	II
Gongjiang	50	66	600	800	VII	III	III
Boyanghe	45	30	260	480	VI	VI	III
Jinhe	75	50	330	540	VI	IV	IV
Lushui	39	0	450	680	-	IV	III
Yangtze River in Jiangxi	137	14200	26800	29600	I	D	D
Jiangxi-Guangdong Canal	138	0	4300	5500	VII	III	II
Jiangxi-Zhejiang Canal	184	0	1110	3750	-	III	III

Figure S1. Schematic diagram of ports and waterways in Jiangxi Province. The solid blue line is the navigable channel in 2050. The purple points represent the confluence of Jiangxi Province's inland waterways with neighbor provinces.

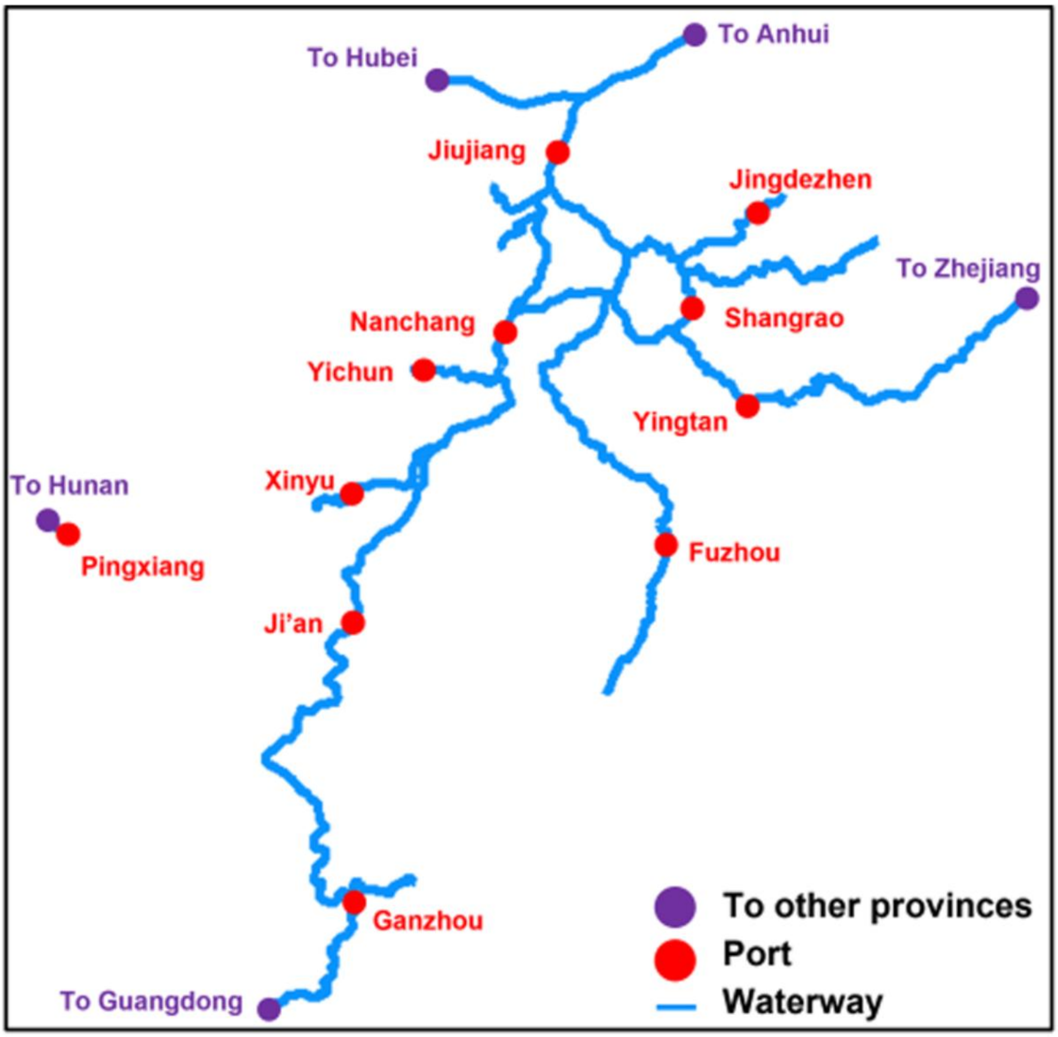


Figure S2. The field map of waterway cargo transportation in Jiangxi Province in (A) 2019, (B) 2035, and (C) 2050.

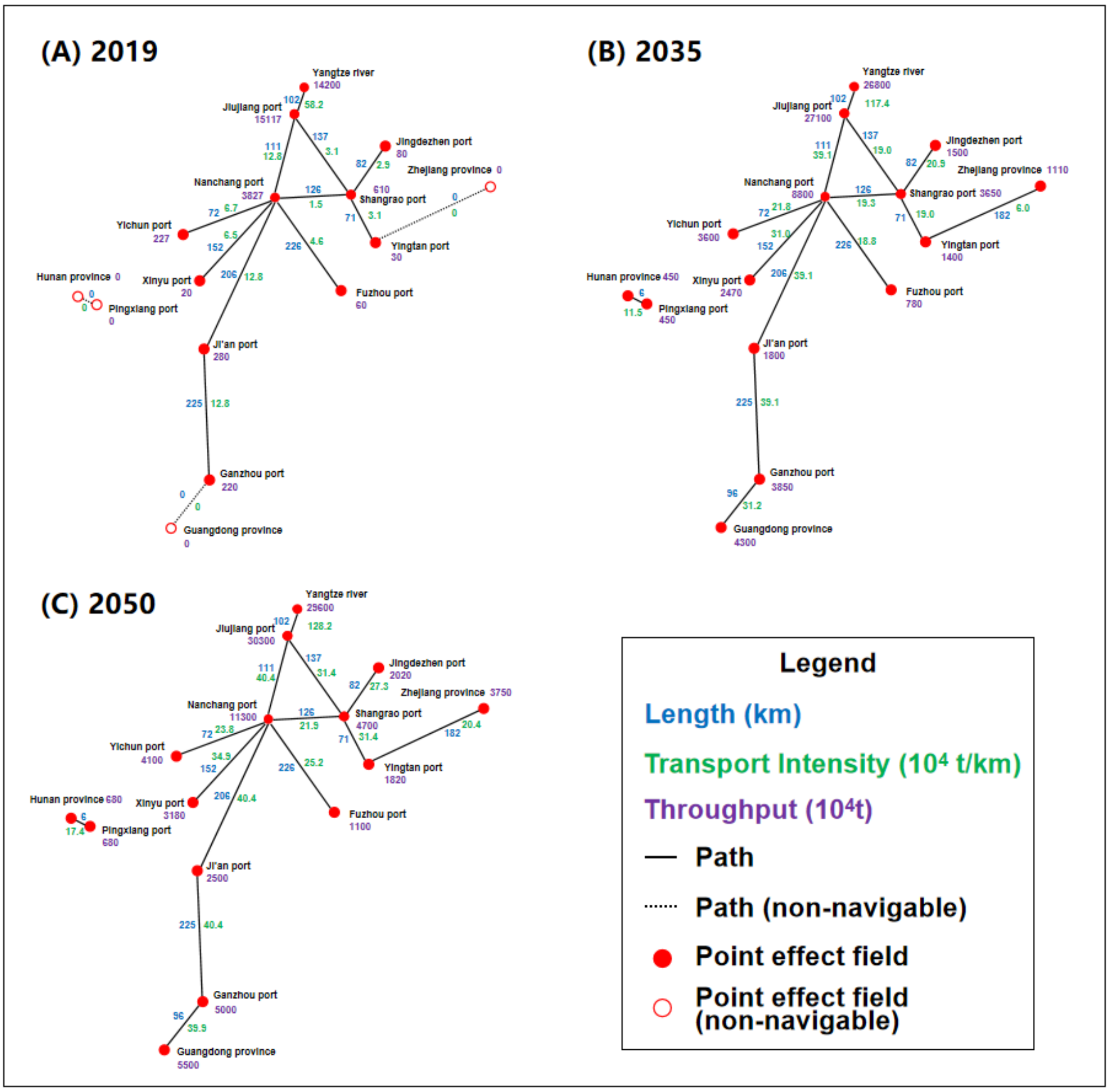


Table S3. The ports' cargo transport flow probability in 2019. Cargo out of port a to port b.

Port a **Port b** **Port b**	Jiujiang	Nanchang	Shangrao	Jingdezhen	Xinyu	Yichun	Pingxiang	Fuzhou	Yingtan	Ji'an	Ganzhou	Yangtze	Zhejiang	Guangdong	Hunan
Jiujiang	0.00%	9.02%	4.78%	4.08%	6.45%	7.32%	0.00%	5.14%	4.18%	9.02%	9.02%	40.99%	0.00%	0.00%	0.00%
Nanchang	11.53%	0.00%	6.71%	5.69%	5.86%	6.04%	0.00%	4.15%	5.84%	11.53%	11.53%	31.13%	0.00%	0.00%	0.00%
Shangrao	8.12%	8.90%	0.00%	3.47%	8.47%	8.70%	0.00%	7.28%	3.71%	11.80%	12.96%	26.61%	0.00%	0.00%	0.00%
Jingdezhen	7.76%	8.46%	3.89%	0.00%	8.54%	8.55%	0.00%	8.83%	4.01%	11.80%	13.38%	24.78%	0.00%	0.00%	0.00%
Xinyu	9.79%	6.95%	7.57%	6.81%	0.00%	7.02%	0.00%	5.73%	8.10%	10.83%	12.75%	24.44%	0.00%	0.00%	0.00%
Yichun	10.44%	6.73%	7.30%	6.41%	6.59%	0.00%	0.00%	5.13%	6.54%	11.27%	11.97%	27.62%	0.00%	0.00%	0.00%
Pingxiang	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Fuzhou	9.32%	5.87%	7.77%	8.41%	6.85%	6.52%	0.00%	0.00%	7.27%	10.86%	12.73%	24.41%	0.00%	0.00%	0.00%
Yingtan	7.79%	8.49%	4.06%	3.92%	9.93%	8.54%	0.00%	7.47%	0.00%	11.74%	13.25%	24.82%	0.00%	0.00%	0.00%
Ji'an	10.69%	10.69%	8.25%	7.35%	8.46%	9.37%	0.00%	7.11%	7.48%	0.00%	10.69%	19.92%	0.00%	0.00%	0.00%
Ganzhou	10.46%	10.46%	8.86%	8.16%	9.12%	9.74%	0.00%	8.15%	8.26%	10.46%	0.00%	16.33%	0.00%	0.00%	0.00%
Yangtze	21.90%	13.00%	8.38%	6.96%	8.60%	10.35%	0.00%	7.20%	7.13%	8.97%	7.52%	0.00%	0.00%	0.00%	0.00%
Zhejiang	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Guangdong	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Hunan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table S4. The ports' cargo transport flow probability in 2035. Cargo out of port a to port b.

Port a **Port b** **Port b**	Jiujiang	Nanchang	Shangrao	Jingdezhen	Xinyu	Yichun	Pingxiang	Fuzhou	Yingtan	Ji'an	Ganzhou	Yangtze	Zhejiang	Guangdong	Hunan
Jiujiang	0.00%	8.41%	6.14%	5.72%	7.40%	6.94%	0.00%	5.48%	5.67%	8.41%	8.41%	25.24%	4.04%	8.15%	0.00%
Nanchang	9.86%	0.00%	7.06%	6.62%	6.21%	5.50%	0.00%	4.74%	6.56%	9.86%	9.86%	19.49%	4.73%	9.50%	0.00%
Shangrao	8.34%	8.17%	0.00%	5.84%	8.51%	7.77%	0.00%	6.89%	5.55%	9.64%	10.23%	16.14%	2.82%	10.09%	0.00%
Jingdezhen	8.20%	8.09%	6.17%	0.00%	8.55%	7.84%	0.00%	7.15%	6.17%	9.61%	10.33%	14.98%	2.66%	10.25%	0.00%
Xinyu	8.99%	6.43%	7.61%	7.24%	0.00%	7.32%	0.00%	6.19%	7.21%	9.31%	9.56%	15.04%	5.64%	9.45%	0.00%
Yichun	8.78%	5.93%	7.23%	6.92%	7.62%	0.00%	0.00%	5.31%	6.86%	9.41%	9.96%	17.06%	5.20%	9.72%	0.00%
Pingxiang	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
Fuzhou	8.08%	5.96%	7.48%	7.36%	7.51%	6.19%	0.00%	0.00%	7.29%	9.03%	10.18%	14.84%	5.94%	10.14%	0.00%
Yingtan	8.24%	8.12%	5.93%	6.25%	8.62%	7.88%	0.00%	7.19%	0.00%	9.73%	10.47%	15.31%	1.87%	10.39%	0.00%
Ji'an	9.06%	9.06%	7.66%	7.23%	8.26%	8.02%	0.00%	6.60%	7.22%	0.00%	9.06%	13.48%	5.84%	8.51%	0.00%
Ganzhou	8.97%	8.97%	8.04%	7.69%	8.48%	8.40%	0.00%	7.37%	7.69%	8.97%	0.00%	11.81%	6.46%	7.16%	0.00%
Yangtze	16.31%	10.73%	7.68%	6.75%	8.00%	8.72%	0.00%	6.51%	6.81%	8.08%	7.15%	0.00%	4.97%	8.30%	0.00%
Zhejiang	7.87%	7.84%	4.04%	3.62%	9.04%	8.00%	0.00%	7.85%	2.51%	10.54%	11.79%	14.99%	0.00%	11.91%	0.00%
Guangdong	8.68%	8.62%	7.92%	7.62%	8.28%	8.19%	0.00%	7.33%	7.62%	8.41%	7.14%	13.68%	6.51%	0.00%	0.00%
Hunan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table S5. The ports' cargo transport flow probability in 2050. Cargo out of port a to port b.

Port a **Port b** **Port b**	Jiujiang	Nanchang	Shangrao	Jingdezhen	Xinyu	Yichun	Pingxiang	Fuzhou	Yingtan	Ji'an	Ganzhou	Yangtze	Zhejiang	Guangdong	Hunan
Jiujiang	0.00%	7.92%	6.16%	5.86%	7.30%	6.64%	0.00%	5.92%	6.16%	7.92%	7.92%	25.14%	5.15%	7.91%	0.00%
Nanchang	8.77%	0.00%	7.68%	7.25%	7.58%	5.17%	0.00%	5.47%	7.49%	8.77%	8.77%	17.91%	6.38%	8.75%	0.00%
Shangrao	7.21%	8.13%	0.00%	6.27%	8.09%	7.54%	0.00%	7.02%	7.21%	8.66%	8.86%	16.70%	5.40%	8.90%	0.00%
Jingdezhen	7.25%	8.10%	6.63%	0.00%	8.22%	7.69%	0.00%	7.30%	7.09%	8.76%	9.07%	14.83%	5.93%	9.14%	0.00%
Xinyu	8.37%	7.85%	7.92%	7.62%	0.00%	7.04%	0.00%	6.54%	7.79%	8.56%	8.55%	14.08%	6.90%	8.79%	0.00%
Yichun	8.07%	5.67%	7.82%	7.55%	7.47%	0.00%	0.00%	5.92%	7.76%	8.60%	9.06%	16.11%	6.84%	9.13%	0.00%
Pingxiang	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
Fuzhou	7.84%	6.54%	7.93%	7.81%	7.56%	6.46%	0.00%	0.00%	7.96%	8.43%	9.13%	13.76%	7.29%	9.29%	0.00%
Yingtan	7.46%	8.20%	7.46%	6.94%	8.23%	7.74%	0.00%	7.29%	0.00%	8.75%	9.00%	15.03%	4.85%	9.06%	0.00%
Ji'an	8.54%	8.54%	7.97%	7.63%	8.05%	7.63%	0.00%	6.86%	7.78%	0.00%	8.54%	13.06%	6.89%	8.51%	0.00%
Ganzhou	8.49%	8.49%	8.11%	7.85%	8.19%	7.99%	0.00%	7.39%	7.96%	8.49%	0.00%	11.41%	7.24%	8.38%	0.00%
Yangtze	15.89%	10.22%	9.01%	7.57%	7.76%	8.38%	0.00%	6.57%	7.84%	7.66%	6.73%	0.00%	5.87%	6.50%	0.00%
Zhejiang	7.28%	8.14%	6.51%	6.77%	8.50%	7.95%	0.00%	7.79%	5.65%	9.03%	9.55%	13.14%	0.00%	9.69%	0.00%
Guangdong	8.47%	8.47%	8.14%	7.91%	8.22%	8.05%	0.00%	7.52%	8.01%	8.46%	8.38%	11.02%	7.35%	0.00%	0.00%
Hunan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table S6. The port-to-port cargo transport flow in 2019. Unit: 10^4 t.

Port	Jiujiang	Nanchang	Shangrao	Jingdezhen	Xinyu	Yichun	Pingxiang	Fuzhou	Yingtan	Ji'an	Ganzhou	Yangtze	Zhejiang	Guangdong	Hunan
Jiujiang	0.00														
Nanchang	1362.80	0.00													
Shangrao	723.18	256.63	0.00												
Jingdezhen	616.65	217.71	21.15	0.00											
Xinyu	975.14	224.16	51.65	6.83	0.00										
Yichun	1107.28	231.06	53.05	14.55	14.96	0.00									
Pingxiang	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
Fuzhou	777.32	158.64	44.38	7.06	4.11	11.64	0.00	0.00							
Yingtan	632.56	223.31	22.60	3.21	2.98	14.85	0.00	4.36	0.00						
Ji'an	1362.80	441.43	71.99	20.59	23.68	26.24	0.00	19.90	20.94	0.00					
Ganzhou	1362.80	441.43	79.06	17.95	20.06	27.18	0.00	17.94	18.17	29.93	0.00				
Yangtze	6196.48	1845.48	1189.34	987.87	1221.58	1469.69	0.00	1021.94	1012.06	1274.39	1068.08	0.00			
Zhejiang	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Guangdong	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Hunan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table S7. The port-to-port cargo transport flow in 2035. Unit: 10^4 t.

Port	Jiujiang	Nanchang	Shangrao	Jingdezhen	Xinyu	Yichun	Pingxiang	Fuzhou	Yingtan	Ji'an	Ganzhou	Yangtze	Zhejiang	Guangdong	Hunan
Jiujiang	0.00														
Nanchang	2277.98	0.00													
Shangrao	1664.70	621.53	0.00												
Jingdezhen	1549.78	582.38	213.31	0.00											
Xinyu	2005.25	546.22	310.49	178.92	0.00										
Yichun	1881.43	483.96	283.47	249.00	274.49	0.00									
Pingxiang	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
Fuzhou	1484.85	417.36	251.60	107.31	152.92	191.11	0.00	0.00							
Yingtan	1536.13	577.07	202.46	92.55	178.10	246.87	0.00	100.62	0.00						
Ji'an	2277.98	868.03	352.01	144.14	230.04	338.86	0.00	118.81	136.15	0.00					
Ganzhou	2277.98	868.03	373.43	296.01	326.64	358.48	0.00	283.62	296.06	345.29	0.00				
Yangtze	6839.78	2876.30	2058.40	1809.00	2144.31	2335.81	0.00	1743.58	1824.42	2164.90	1917.02	0.00			

Zhejiang	1095.40	415.83	102.81	40.17	139.25	187.11	0.00	87.15	27.89	117.03	248.59	1332.19	0.00		
Guangdong	2208.73	836.08	368.35	327.49	356.14	352.05	0.00	315.08	327.50	361.73	307.20	2224.13	279.98	0.00	
Hunan	0.00	0.00	0.00	0.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table S8. The port-to-port cargo transport flow in 2050. Unit: 10^4 t.

Port	Jiujiang	Nanchang	Shangrao	Jingdezhen	Xinyu	Yichun	Pingxiang	Fuzhou	Yingtan	Ji'an	Ganzhou	Yangtze	Zhejiang	Guangdong	Hunan
Jiujiang	0.00														
Nanchang	2400.46	0.00													
Shangrao	1865.70	868.09	0.00												
Jingdezhen	1774.49	818.86	294.78	0.00											
Xinyu	2211.59	856.48	380.38	242.20	0.00										
Yichun	2012.39	584.08	354.29	309.56	306.09	0.00									
Pingxiang	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
Fuzhou	1794.79	618.43	329.89	147.43	208.04	242.88	0.00	0.00							
Yingtan	1865.70	846.39	339.05	143.17	247.71	318.04	0.00	132.61	0.00						
Ji'an	2400.46	991.46	406.90	190.78	272.12	352.67	0.00	171.50	194.54	0.00					
Ganzhou	2400.46	991.46	416.62	392.62	409.41	399.51	0.00	369.54	398.06	424.48	0.00				
Yangtze	7617.29	3024.44	2667.39	2241.83	2298.10	2480.94	0.00	1943.35	2320.29	2266.12	1992.18	0.00			

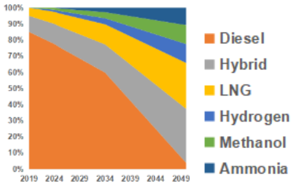
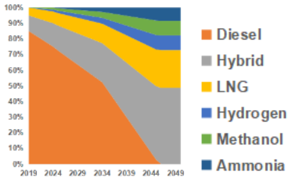
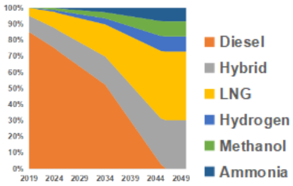
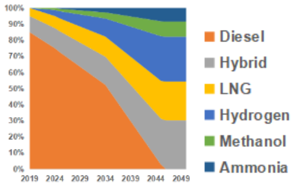
Zhejiang	1560.69	720.79	253.60	253.78	318.82	298.20	0.00	291.95	212.00	338.63	362.19	1738.80	0.00		
Guangdong	2395.99	989.22	447.79	435.14	451.85	442.91	0.00	413.44	440.48	465.17	461.12	1923.62	404.24	0.00	
Hunan	0.00	0.00	0.00	0.00	0.00	0.00	680.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table S9. The parameters of ship power mode. The fuel consumption per km (FC_i) can be calculated by multiplying the energy consumption per km (*EC*) and the specific fuel consumption (*SFC*), i.e. $FC = EC \times SFC$. For dual-fuel ship power mode (i.e. LNG, hybrid, and methanol in this study), FC_i of the main fuel can be calculated as $FC_{main} = EC_{main} \times SFC_{main} \times \omega$, and the pilot fuel can be calculated as $FC_{pilot} = EC_{pilot} \times SFC_{pilot} \times (1 - \omega)$, ω is the proportions of the main fuel; for hydrogen ship power mode, FC can be calculated as $FC = EC/(48\% \times 33.3)$. The target ship selected for this study was a typical ship on the Yangtze River, followed by Yan et al., 2023 [5]. The design speed of a typical ship is 18.5 km/h, which usually uses the traditional mechanical propulsion system with two propellers.

Power Mode	Engine Type	Fuel Type	EC ((kWh/km)	SFC (g/kWh)	Fuel Proportion	**FC (kg/km)**	**EF (CO_2 kg/kg)**
Diesel	Diesel Engine	diesel	23.84	215.0	100%	5.13	3.206
LNG	Dual Fuel Engine	LNG	21.46	154.4	99%	3.92	2.75
		pilot diesel		1.8	1%	0.05	3.206
Hybrid	Gas Engine	LNG	21.46	166.0	90%	3.56	2.75
	Battery	electric	10-60	-	10%	-	0
Methanol	Methanol Engine	methanol	22.67	327.2	95%	7.41	1.38
		pilot diesel		10.1	5%	0.012	3.206
Hydrogen	PEM Fuel Cell	liquid hydrogen	23.84	-	100%	1.49	0
Ammonia	Ammonia Engine	liquid ammonia	26.22	450.0	100%	11.80	0
Electricity	Battery	electric	10-60	-	100%	-	0

Table S10. Detailed information and parameter values for ship power mode scenarios. The ship power mode scenarios design was followed Yan et al., 2023 [5]. In the REF scenario, the initial γ_i values of diesel, hybrid, and LNG were set to 0.85, 0.1, and 0.05, respectively. The annual growth of hybrid and LNG was set to 0.005 before 2035, and 0.01 after 2035. The annual growth of hydrogen, methanol, and ammonia was set to 0.0025 before 2035, and 0.005 after 2035. This setting is based on China's route design for carbon emission reduction from ships, i.e., focusing on technical measures such as energy efficiency improvement in the near term and relying on alternative fuels in the long term [6]. Since ammonia fuel is currently still under research and testing, it is assumed that ammonia fuel will not be used in ships until 2025 [7]. When the share of diesel is equal to 0, we assumed that the emission reduction capacity of alternative fuel measure reaches its maximum, after which the fuel mix structure would not change. In the other scenarios, only the average annual growth of the preferred development fuel was increased by an additional 0.005 before 2035, and 0.01 after 2035, and the parameters of other fuels remain unchanged as the REF scenario.

To assess the emission reduction potential of fully electric ships and evaluate their comparative advantages over hybrid ships, we developed the Electricity Scenario (ES) by replacing all hybrid ships in the HBS scenario with fully electric ships.

Scenario	Abbreviation	Description	γ_i value
Diesel Scenario	REF	Reference	
Hybrid Scenario	HBS	Prefer Hybrid as the primary alternative fuel	
LNG Scenario	LS	Prefer LNG as the primary alternative fuel	
Hydrogen Scenario	HYS	Prefer Hydrogen as the primary alternative fuel	

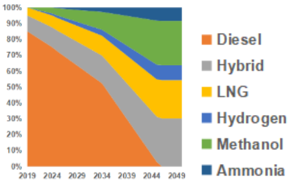
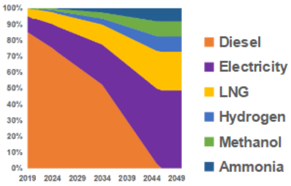
Methanol Scenario	MS	Prefer Methanol as the primary alternative fuel	
Electricity Scenario	ES	Prefer Electricity as the primary power	

Table S11. Detailed information and parameter values for ship technology improvement scenarios. (A) The maximum net ship load corresponds to the navigability level of the waterways. Determined based on the ship survey results in the plan [1] and Chinese waterway standards [2-4]; (B) Parameters intervals for gradient scenarios. According to the results of the 2019 ship survey in the Yangtze River in Jiangxi Province, the average net load of the ship was 1633 t, set as in the BAU scenario. In the Highly ambitious scenario (HAS), we assumed that the navigational potential of the waterways can be exhausted (not possible in realistic management). For the setting of α, this study refers to the literature [4,8,9,10] and Energy Efficiency Design Index (EEDI) and Energy Efficiency Existing-Ship Index EEXI) from IMO and China Classification Society (CCS), and ship energy efficiency management plan (SEEMP) from IMO [11-16].

(A) The maximum net ship load corresponding to the navigability level of the waterways.

Waterway	LD_{max} Unit: t		
	2019	2035	2050
Xinjiang	1000	1000	2000
Ganjiang	2000	3000	3000
Yuanhe	50	1000	2000
Changjiang	300	1000	2000
Leanhe	100	1000	2000
Fuhe	50	50	1000
Xiuhe	100	1000	2000
Ganjiangdonghe	500	1000	1000
Xinjiangxidahe	50	1000	2000
Gongjiang	50	1000	1000
Boyanghe	100	100	1000
Jinhe	100	500	500
Lushui	0	500	1000
Yangtze River in Jiangxi	3000	10000	15000
Jiangxi-Guangdong Canal	0	1000	2000
Jiangxi-Zhejiang Canal	0	1000	1000

(B) Parameters intervals for gradient scenarios.

Scenarios	α			β		
	2019	2035	2050	2019	2035	2050
HAS scenario	0.05	0.20	0.35	0.55	0.8	1
BAU scenario		0.05			0.55	
Gradient scenarios	0.05	(0.05,0.20)	(0.05,0.35)	0.55	(0.55,0.8)	(0.55,1)

Supplemental References

1. People’s Government of Jiangxi Province. 2022. Jiangxi Province inland waterways and ports layout plan (2021-2050). Nanchang. http://www.jiangxi.gov.cn/art/2022/5/20/art_14248_3966403.html.
2. Ministry of Housing and Urban-Rural Development of the People’s Republic of China, General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China. (2014). Navigation standard of inland waterway. GB 50139-2014. Beijing.
3. Ministry of Transport of the People’s Republic of China. (2011). Navigation Standard of Canal. JTS 180-2-2011. Beijing.
4. Ministry of Transport of the People’s Republic of China. (2020). .JTS 180-4-2020. Beijing.
5. Yan, X., He, Y., Fan, A. (2023). Carbon footprint prediction considering the evolution of alternative fuels and cargo: A case study of Yangtze river ships. Renewable and Sustainable Energy Reviews 173, 113068.
6. Fan, A., Xiong, Y., Yang, L., Zhang, H., He, Y. (2023). Carbon footprint model and low-carbon pathway of inland shipping based on micro-macro analysis. Energy 263, 12650.
7. Pacific Environment, Ocean Conservancy. (2021). All aboard: how the biden-harris administration can help ships kick fossil fuels.
8. Fan, A., Yan, X., Bucknall, R., Yin, Q., Ji, S., Liu, Y., Song, R., Chen, X. (2020). A novel ship energy efficiency model considering random environmental parameters. Journal of Marine Engineering & Technology 19:4, 215-228.
9. Sun, X., Yan, X., Wu, B., Song, X. (2013). Analysis of the operational energy efficiency for inland river ships. Transportation Research Part D - Transport and Environment 22, 34-39.
10. Sogut, M.Z., Ozkaynak, S. (2023). Energy Efficiency and Management Onboard Ships. In: Zincir, B., Shukla, P.C., Agarwal, A.K. (eds) Decarbonization of Maritime Transport. Energy, Environment, and Sustainability. Springer, Singapore. https://doi.org/10.1007/978-981-99-1677-1_10.
11. IMO. (2022). 2022 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships. MEPC.364(79).
12. IMO. (2022). 2022 Guidelines on the survey and certification of the Energy Efficiency Design Index (EEDI). MEPC.365(79).
13. IMO. (2022). 2022 Guidelines on the method of calculation of the attained Energy Efficiency Existing Ship Index (EEXI). MEPC.350(78).
14. IMO. (2022). 2022 Guidelines on survey and certification of the attained Energy Efficiency Existing Ship Index (EEXI). MEPC.351(78).
15. CCS. (2022). Guidelines for Calculation and Verification of Energy Efficiency Design Index of inland ships. GD31-2022.
16. IMO. (2022). Ship energy efficiency management plan. MEPC.346(78).