

A Green New Deal (Green Recovery) Plan for Japan and its Economic Benefits

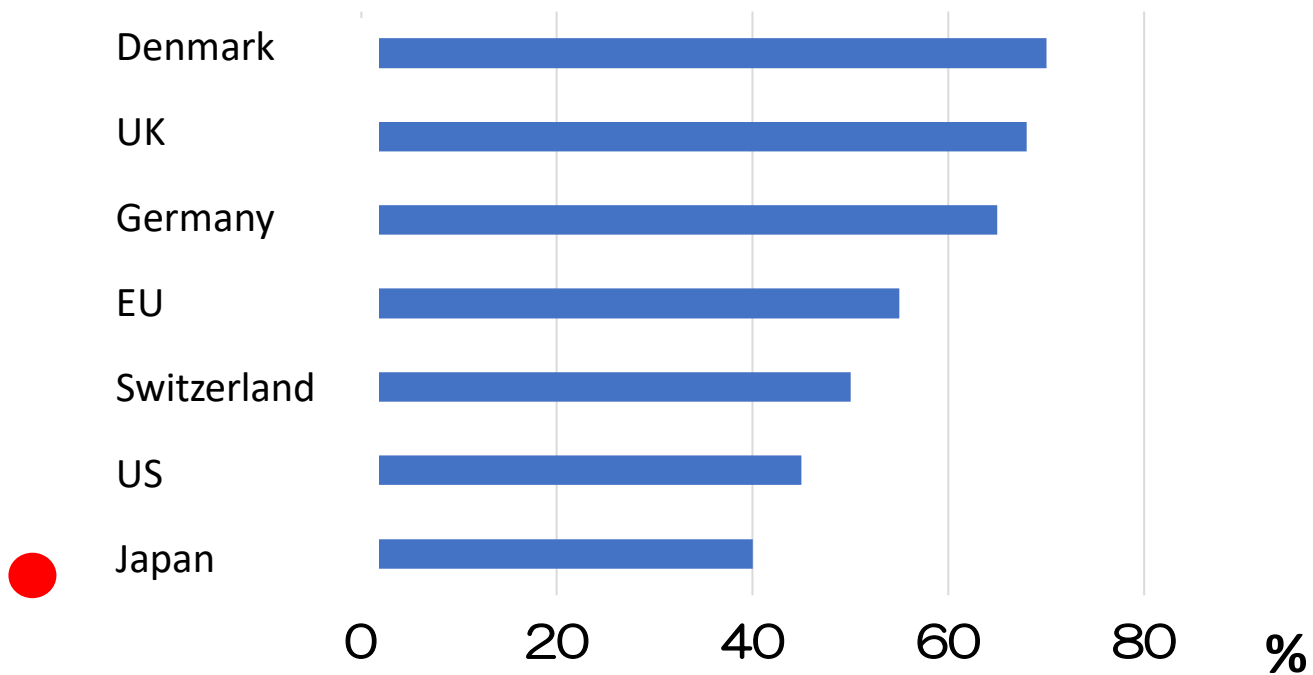
Oct 4, 2022

ASUKA Jusen

Tohoku Univ., Japan

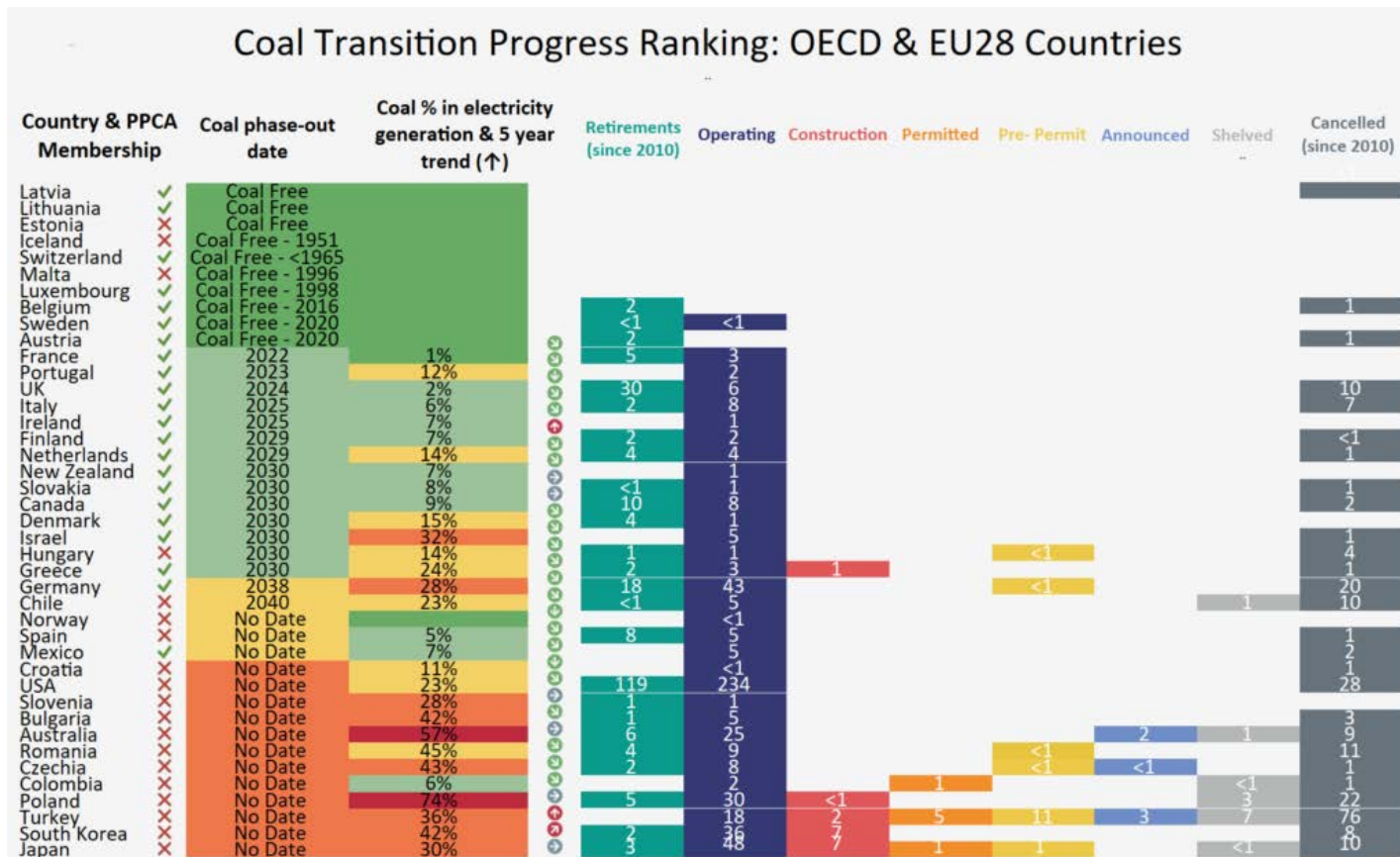
asukajusen@gmail.com

CO₂ Emission Reduction Target (compared with 1990)



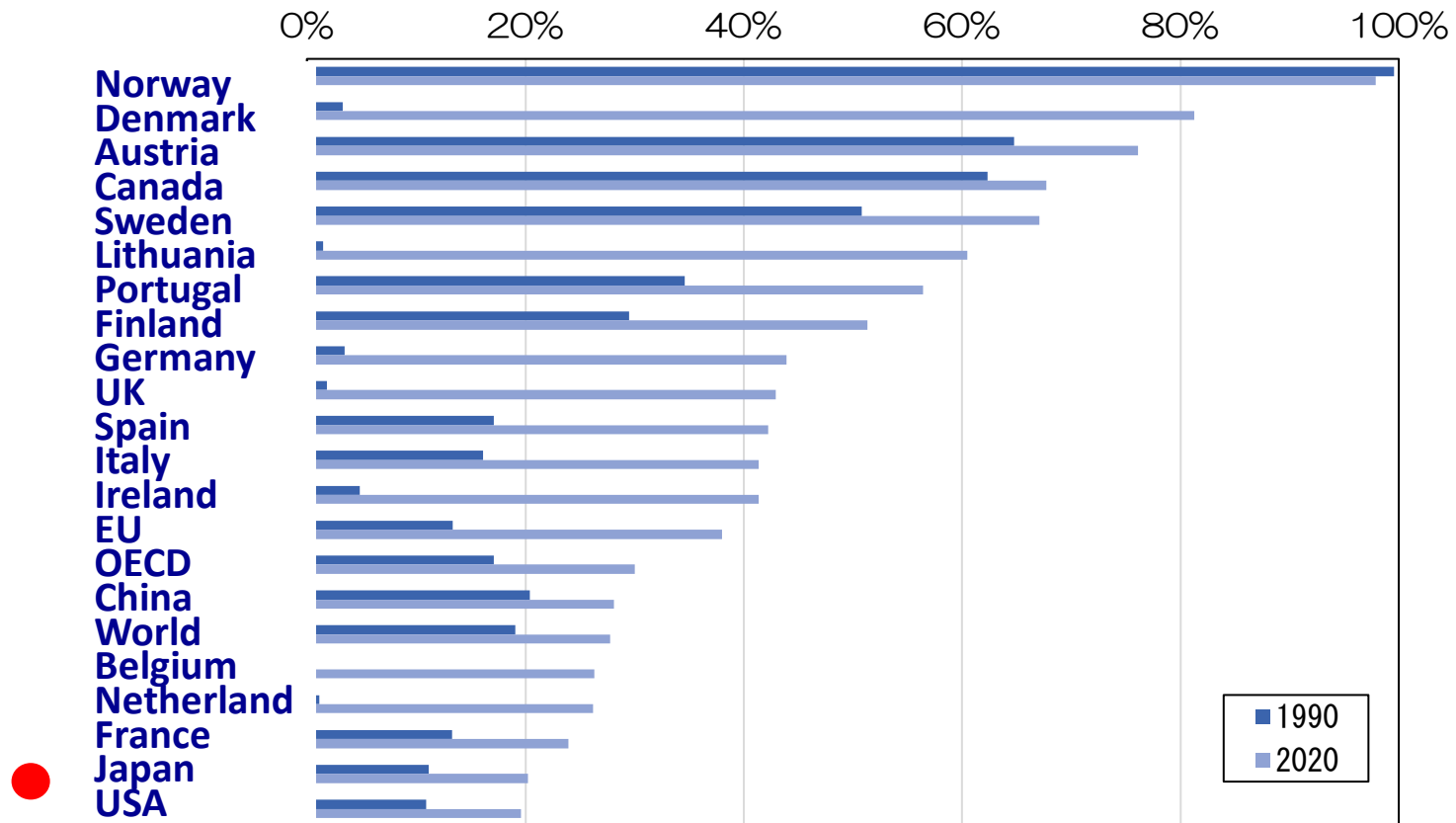
Coal power transition ranking

2 March 2021



Resource: Littlecott and Roberts (2021)

Proportion of the renewable electricity (1990-2020)





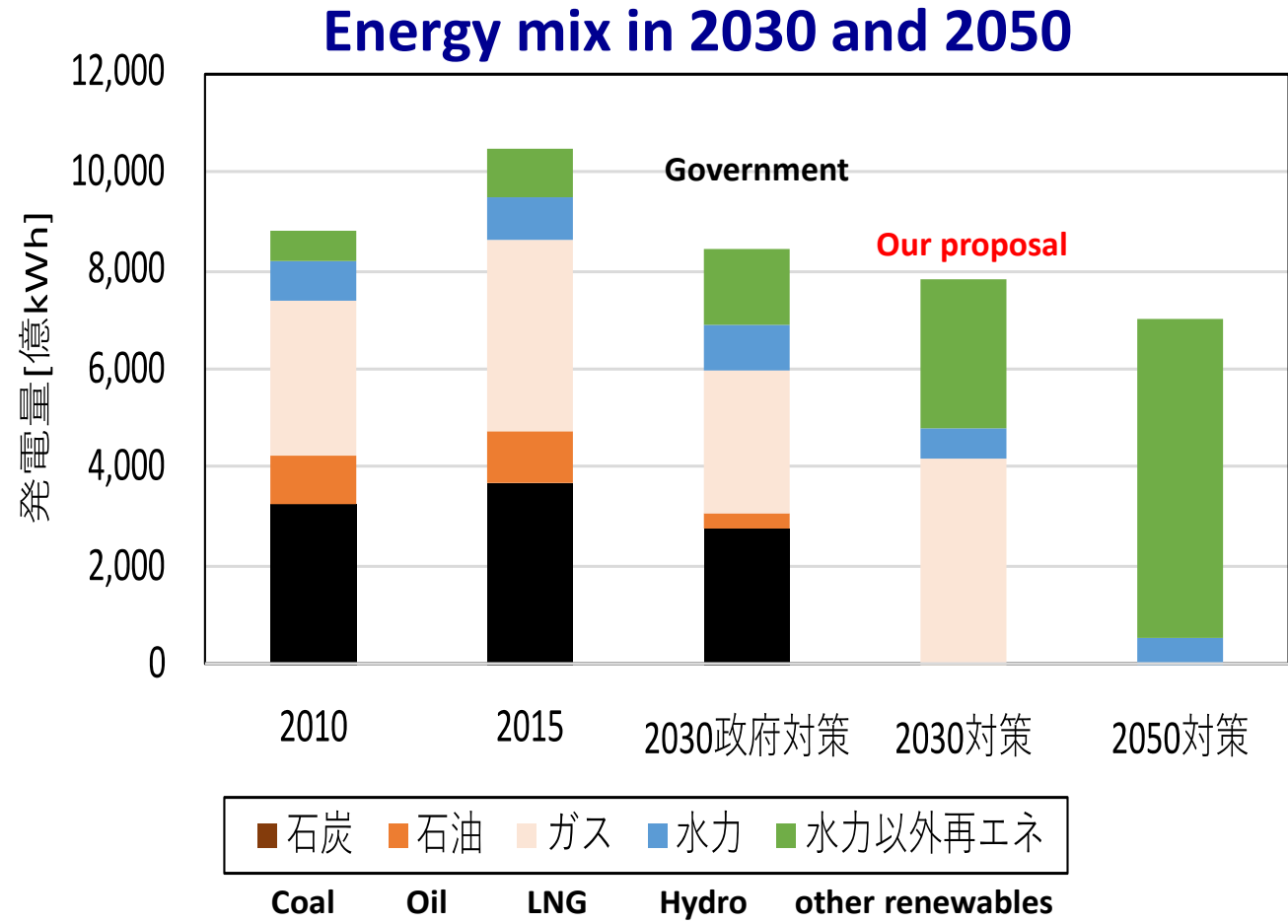
レポート 2030

グリーン・リカバリーと 2050 年カーボン・ニュートラルを
実現する 2030 年までのロードマップ



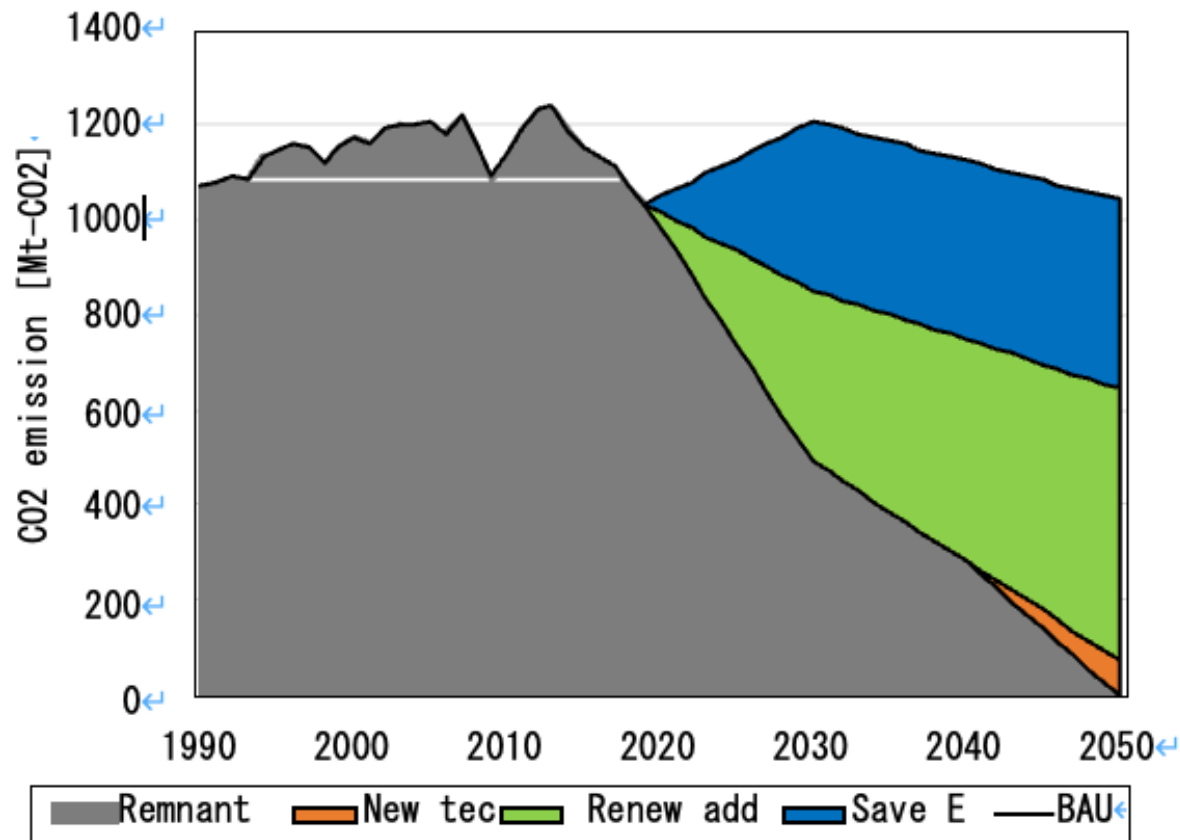
未来のためのエネルギー転換研究グループ

Our alternative energy mix target proposal (GR strategy)



Source: Research group on the energy transition for the future (2021)

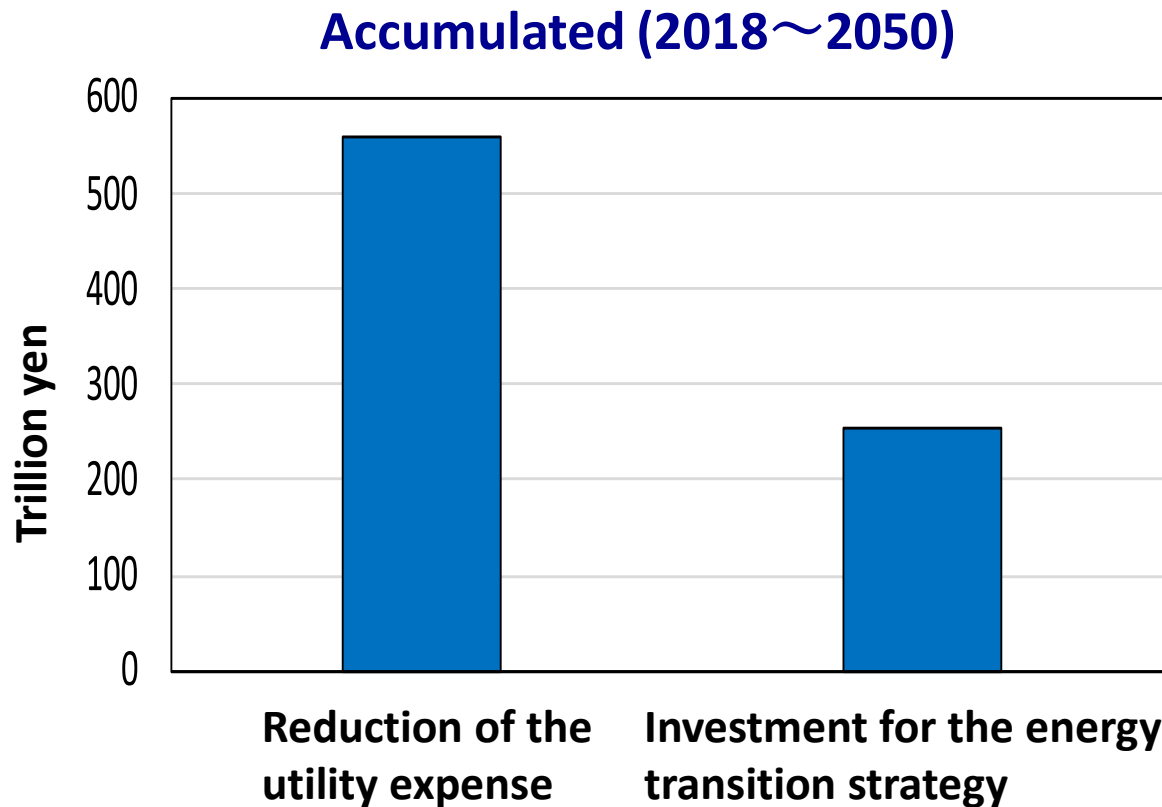
CO2 emission reductions under GR Strategy



Investments needed for each sector

Ind.	Types	Investment amount to 2030 [TY]	Ratio of Private/pub. expenditure	Accum. energycost reduction by 2050 (TY)	Jobscreated by 2030 [10000/year]	Jobs created per investment [#-yr/100 MY]	In 2030 CO ₂ red. [Mt-CO ₂]
Power	1. Renew. power plants	29.3	Mainly private	86.3	285	9.7	360
	2. Power grids	16.0	Mainly public		287	17.9	
	3. Heat supply network	6.0	Mainly public		108	18.0	32
Industry	4. Power usage at raw materials manufacturing	18.5	Mainly private	23.1	179	9.7	58
	5. Power used at non-material ind.	7.3	Mainly private	14.6	62	8.5	21
Business	6. Power for machines	17.8	Mainly private	35.6	128	7.2	45
	7. Heat for insul. bldg. and zero emissions	16.8	Mainly private	42.1	275	16.3	28
Household	8. Power for home appl. & machines	13.3	Mainly private	26.7	96	7.2	20
	9a. Heat for bldg insl. and zero emissionhouses	15.2	Mainly private	30.3	267	17.6	28
	9b. Heat for public housing with insl. andzero emissions	1.7	Mainly public	3.4	30	17.6	
Transportation	10. Fuel eff. electriccars, taxis, buses	20.4	Mainly private	57.6	183	9.0	81
	11. Fuel eff. electric trucks	11.2	Mainly private	35.5	119	10.6	38
	12. Higher efficiency rail, ships, airplanes	1.5	Mainly private	3.0	10	6.7	3
	13. Transport infla.	9.4	Mainly public		167	17.8	3
Sub total		185			2196	11.9	714
	Incl. public funds	33			562	17.0	
HR	14. Experts support, training	13	Mainly public	358	251	19.0	
In fra	15. Smooth transfer of laborers	5	Mainly public		97	20.6	
Sub total		18			348	39.7	
Total		202		358	2544	12.6	714
	Incl. public funds	51			910	17.8	

Investment needed for the energy transition with GR is much smaller than the reduction of utility expense



Source: Research group on the energy transition for the future (2021)

Positive impacts of GR strategy

- **Investment: Accumulated total of 202 tril. Japanese Yen (1.2 trill. USD) by 2030 (Private sector: 151 tril. JPY, public sector: 51 tril. JPY), and 340 tril. JPY by 2050**
- **Economic effects: 205 tril. JPY by 2030 (Increase from official GDP estimates)**
- **Job creation: 25.44 million jobs-year by 2030 (Maintain 2.54 million jobs/yr for 10 years)**
- **Energy cost reduction: 358 tril. JPY (accum.) by 2030 (500 tril. JPY accumulated by 2050)**

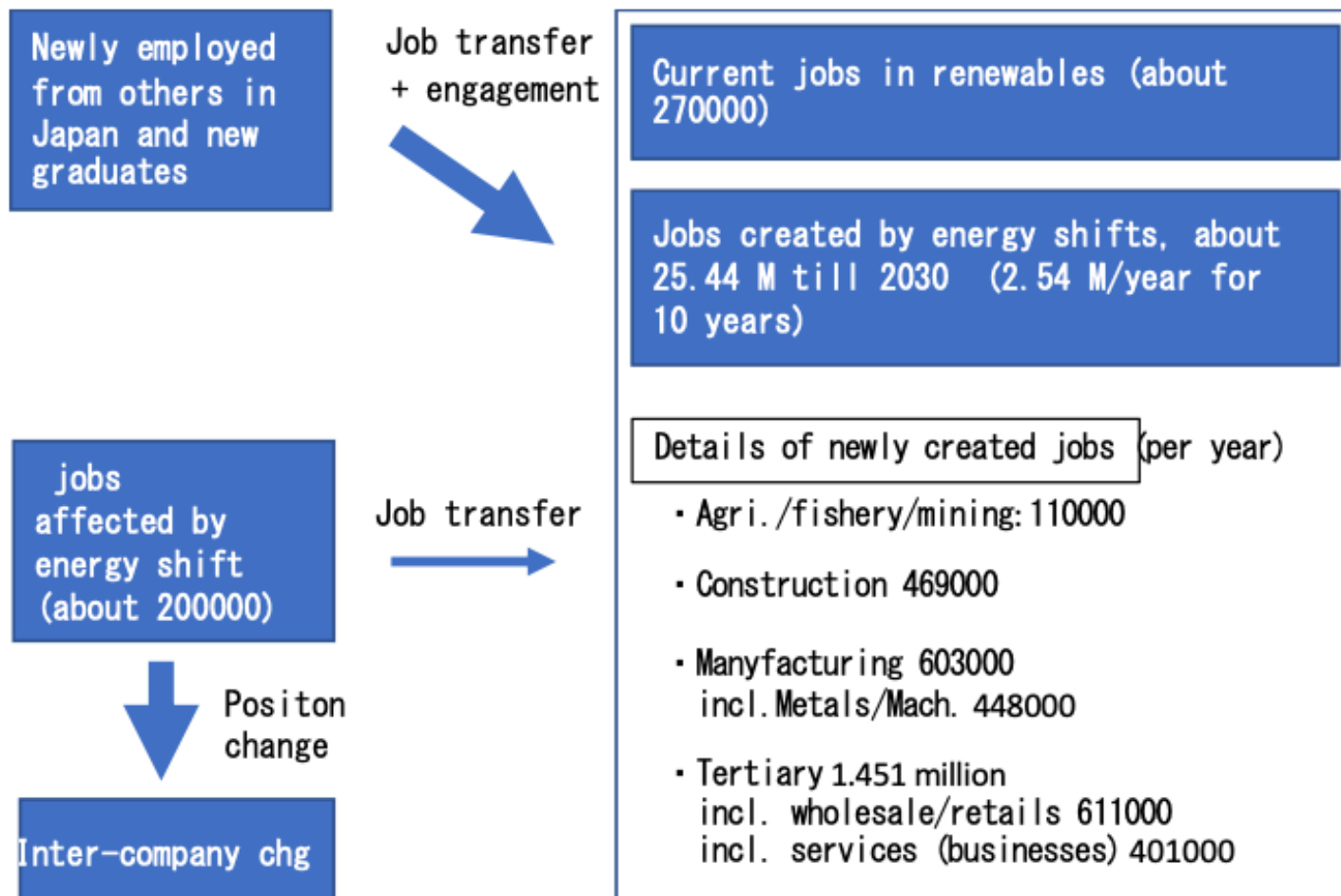
Positive impacts of GR strategy (cont'd)

- **Fossil fuel import reduction: 51.7 trillion JPY (40 billion USD) accumulated by 2030**
- **CO₂ emissions: 55% reduction from 1990 level by 2030 (61% from 2013 level), and 93% reduction from 1990 level by 2050 (with existing technologies only, but 100% reduction with the use of new technologies)**
- **Air pollution deaths avoided: Total 2,920 deaths from exposure to PM2.5 avoided by 2030**

Big CO₂ emitters in Japan: Employment and GDP contribution are not that big

- **Employment of the 6 major CO₂ emitting industries (power, iron and steel, cement, chemicals, oil refinery, and paper manufacturing) is estimated about 150 thousands (GDP contribution is less than 1%)**
- **Employment of the coal power stations is about 3 thousands (GDP contribution is 0.04%)**
- **Employment of the nuclear industry is about 50 thousands**
- **Employment of the renewable energy industry is estimated about 280 thousands (IRENA 2021)**

Image of the just transition in Japan



Comparison with the US Inflation Reduction Law

	2030 CO ₂ Emission reduction compared with 2005	2030 Zero emission power proportion	Investment (10 years to 2030)	Annual Energy cost reduction	Annual Energy cost reduction (household)	GDP increase	Job creation	Avoided premature death by air pollution	Avoided damage cost by climate change
Energy innovation (2022)	-37~-43%	72~85% (nuclear 20%)	<ul style="list-style-type: none"> Public : 369 bil. USD (2023~2033) Capex 180 bil. USD/year 	79~85 bil. USD	79~80 USD	0.65 ~ 0.77 %	1.2~1.3mil. (2030)	2900~4500 (2030)	211.3~335.1 bil. USD (2023~2030)
Princeton Univ. (Jenkins et al. 2022)	-42%		4.1 tri. USD (Only energy supply ; 2023~2033)	50 bil USD (push down the price of oil and Gas by 5% and 10~20%)	Hundreds USD		1.7 mil. (only energy supply : 2030)	35000 (2023~2033)	
Rhodium Group (Larsen et al. 2022)	-32~-42%	60~81% (nuclear 20%)			27~112 USD				
OMB(2022)	-40%								745 bil. USD~1.917 tri.. USD (2023~2050)
Report 2030 (GR strategy)	-61% (compared with 2013)	44% (nuclear 0%)	Supply side : 51.3 trillion yen Demand side : 150.7 trillion yen Public : 50 tri. JPY Private : 151 tri. JPY	35.8 tri. JPY		3.5%	2.54 mil. per year	2920 (2021~2030)	

Conclusion

- **Current administration is not positive on energy transition**
- **Many people in Japan still believe renewable is expensive and energy efficiency improvement are difficult**
- **Government and industry are doubling down on Hydrogen, Ammonia, CCUS to keep existing facilities and business model**
- **Materials to discuss the energy transition is getting ready even in Japan**
- **Communication with the stakeholder, such as the labor union needed**
- **To change the “narrative” still need time**

References

- IRENA (2021) Renewable Energy and Jobs Annual Review 2021

https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/Oct/IRENA_RE_Jobs_2021.pdf

- Littlecott Chris and Roberts Leo (2021) The rise and fall of coal: 2020 transition trends, 01 Mar 2021

<https://www.e3g.org/news/2020-hastens-the-coal-exit/>

- Research group on the energy transition for the future (2021) Report 2030 : Achieving Green Recovery and 2050 Carbon Neutrality Roadmap to 2030, 2021 Feb.

<https://green-recovery-japan.org/>