Population Analysis for Industrial Structure Study in Future Low Carbon Society

A satisfying and fulfilling zero carbon (ZC) society of the future will see changes to the structures of energy supply, society and industry. Additionally, society will need to achieve economic growth in the midst of the significant changes of the employment structure due to a declining population. To clarify the key points necessary for the design of a future ZC society, basic data was compiled to perform an analysis and evaluation of a future industrial structure, taking into account the age range of the labor population.

- The labor population in 2050 will decline by 27% compared to 2018. Even with retirement age extended (from 60–65 to 65–70) and the employment rate increased (1.2 to 1.5 times), declines could only be reduced by around 21% to 24%.
- Without changes in labor productivity, future GDP estimated by multiplying the labor population by age group and industry, will decline by 30 % (Figure 1).
- The LCS scenario [1] proposes an 80% reduction in CO_2 emissions and a 5% annual increase in GDP. Realizing this will require an average productivity increase of 1.5 times (1% per year) across all industries. Such a change would involve a significant occupational shift (Figure 2).
- Incorporating expected future changes to industry and the necessary perspectives of education and welfare allow for more quantitative considerations using the LCS input-output table analysis [1]. This analysis clarifies factors and tactics toward ZC society, and a specific, clear future industrial structure.

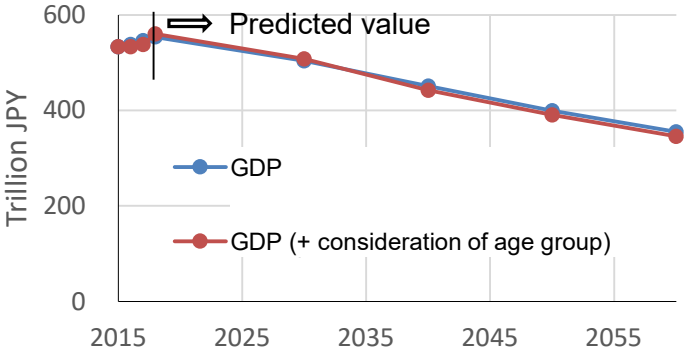

Figure 1: Future GDP values calculated by breakdown of value added

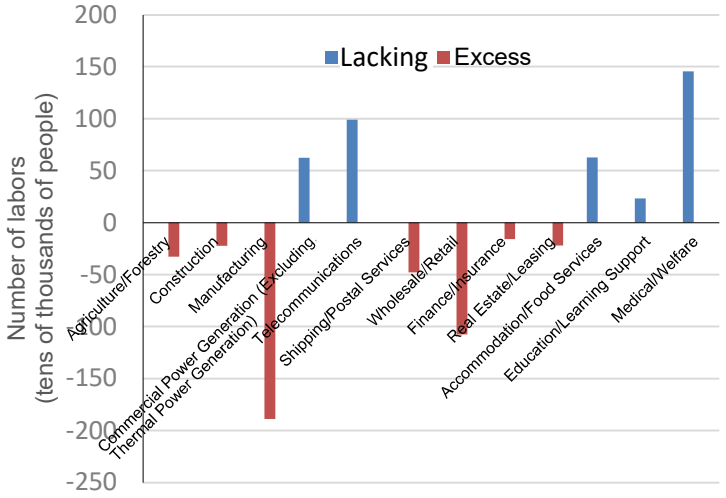

Figure 2: Number of labors lacking at the current labor population structure with assumption of 1.5 times productivity increase in each industry to obtain the GDP of the 80% CO_2 reduction scenario (only representative industries).

Proposals for Policy Development

In the face of a declining labor population, improvements in labor productivity are essential to achieve economic growth while realizing a ZC society.
Tactics that take into account age, as well as ability and knowledge, are essential in new - or rapidly changing - fields of industry. Challenges include providing vocational education for youth, while creating frameworks for elderly that help to provide vocational education for, maintain the health, and adapt areas of societal participation to their needs.

[1] LCS Proposal Paper for Innovation Policy Development: “Changes of Industrial Structure towards Zero Carbon Society: Application of Extended Input-Output Table” Mar. 2020.

https://www.jst.go.jp/lcs/pdf/fy2019-pp-16.pdf