

## Executive Summary

### Innovation responding to COVID-19 in 2020

During the year 2020, 28% of the enterprises in the frame population realised innovation to respond to COVID-19 (at least either one of product innovation or business process innovation to respond to the novel coronavirus infectious disease). During this period, 14% in the frame population realised product innovation to respond to COVID-19 (a new or improved good or service that has been introduced on the market for responding to the novel coronavirus infectious disease), and 22% realised business process innovation to respond to COVID-19 (a new or improved business process for one or more business functions that has been brought into use in the firm for responding to the novel coronavirus infectious disease). Furthermore, during this period, COVID-19 promoted or hampered R&D (research and development) activities in 10% of the frame population.

### Implementing innovation activities and realising innovations

During the three years from 2017 to 2019, the reference period of the J-NIS 2020, 49% of the enterprises in the frame population implemented innovation activities (activities for realising product innovation or business process innovation), and 27% realised innovation. In particular, 10% and 23% of the enterprises realised product innovation and business process innovation, respectively.

In all the product-innovative enterprises, i.e. 44,380 enterprises, 52% realised new-to-market (NTM) product innovation (a new or improved product introduced on the market that is not previously offered by any competitors). The ratio of product innovation sales (proportion of turnover from new products, which have been introduced on the market during 2017 to 2019, to total turnover in 2019) was on average 29%, 7 points of which were comprised of the ratio of NTM product sales.

### Business capabilities for innovation

“Cloud-computing services” as well as “Internet of Things (IoT)” was the most used technology regarding digitalisation. In the frame population, 4% of the enterprises utilised machine learning (AI: artificial intelligence). “Process automation or cost reduction” was the most common purpose to utilise machine

learning, while “improving existing goods or services” was the least common one.

In the frame population, 17% of the enterprises employed at least one or more persons who completed master or doctoral course in a graduate school. In particular, 3% of the enterprises employed at least one or more persons who hold a doctoral degree.

“Satisfaction of established customers” as well as “reaching out to new customer groups” was the most adopted strategy to ensure economic performance. Trademark registration was the most common option regarding the protection of IPRs (intellectual property rights). In the frame population, 4% of the enterprises applied patents.

### **Innovation and knowledge flows**

Product-innovative enterprises were more likely to develop their new products by itself as well as jointly with other enterprises or organisations. Meanwhile, business process-innovative enterprises were more likely to develop their new business processes by other enterprises or organisations, although they were less likely to jointly develop with the others.

In all the innovation-active enterprises, i.e. 215,610 enterprises, 11% co-operated with other enterprises or organisations for innovation activities. In particular, 3% of the enterprises co-operated with universities or other higher education institutions, especially 20% in large-sized enterprises.

“Professional or industry associations” as well as “scientific or technical journals, or trade publications” was the most common channel to acquire knowledge, while “published patents” as well as “reverse engineering” was the least common one.

### **External factors influencing innovation**

Regarding the number of competitors, 41% of the enterprises in the frame population competed with fifty or more other enterprises within Japan, and 8% had no competitors in the country. “Difficult prediction of change in demand” as well as “difficult prediction of competitors’ actions” was the most common factor in terms of the importance of affecting the competitive situation of goods or services, while “strong competition from abroad” was the least common one.

“Lack of skilled employees within the enterprise” as well as “different priorities within the enterprise” was the most common factor in terms of the importance of hampering innovation activities, while “lack of credit or private equity by financial institutions or investors” was the least common one.

### **Product innovation sales in the country as a whole**

A sum of turnover from new products introduced on the market by enterprises in Japan (Gross National Turnover from New-to-Firm Product Innovation: GTNTFInno) reached 78 trillion yen in 2019. Of the GTNTFInno, 16 trillion yen was comprised of a sum of turnover from new-to-market products (Gross National Turnover from New-to-Market Product Innovation: GTNTMInno).

Summary table: Main innovation indicators (2017–2019, 2020 (partly))

		All (442,978)	Small- sized (355,545)	Medium- sized (71,621)	Large- sized (15,812)	Manufac- turing (104,886)	Services (253,683)
Ratio of innovative enterprises that respond to COVID-19 in 2020	(%)	28	27	29	41	22	33
Ratio of product-innovative enterprises that respond to COVID-19 in 2020	(%)	14	14	13	17	10	18
Ratio of business process-innovative enterprises that respond to COVID-19 in 2020	(%)	22	21	24	36	18	27
Ratio of innovation-active enterprises	(%)	49	46	59	69	57	47
Ratio of R&D-active enterprises	(%)	6	5	11	22	14	4
Ratio of innovative enterprises	(%)	27	25	34	51	35	27
Ratio of product-innovative enterprises	(%)	10	9	11	26	16	10
Ratio of business process-innovative enterprises	(%)	23	21	31	45	30	23
Gross turnover from new-to-firm product innovation (2019)	(T. Yen)	78	6	8	65	36	37
Gross turnover from new-to-market product innovation (2019)	(T. Yen)	16	1	3	12	9	6
Total turnover (2019)	(T. Yen)	1,240	180	237	823	397	705
R&D expenditures (2019)	(T. Yen)	9	1	1	8	7	2

Source: Japanese National Innovation Survey 2020, National Institute of Science and Technology Policy.

Notes: “Small-sized”, “medium-sized”, and “large-sized” are the firms with 10–49, 50–249, and 250 and more persons employed, respectively. Figures are population-weighted values.