Vocational Training at Linde in Germany

Apprenticeship and Dual Study Programs

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Making our world more productive

Contents

Gases Business
Production and distribution of technical & medical gases

Gases Business
A wide range of products

Atmospheric Gases

Nitrogen

Oxygen

Argon

Rare gases

- Krypton
- Neon
- Xenon

Process Gases

- Acetylene
- Helium
- Propane
- Carbon dioxide
- Carbon monoxide
- Hydrogen

Medical Gases

- Medical oxygen
- Nitric oxide
- Nitrous oxide

Specialty Gases

- Electronic gases (arsine, phosphine, silane, mixtures)
- Instrument gases and mixtures

Linde Engineering
Planning and constructing process engineering plants

Linde Engineering
Product segments

For Linde and for Third-party Customers

Air Separation

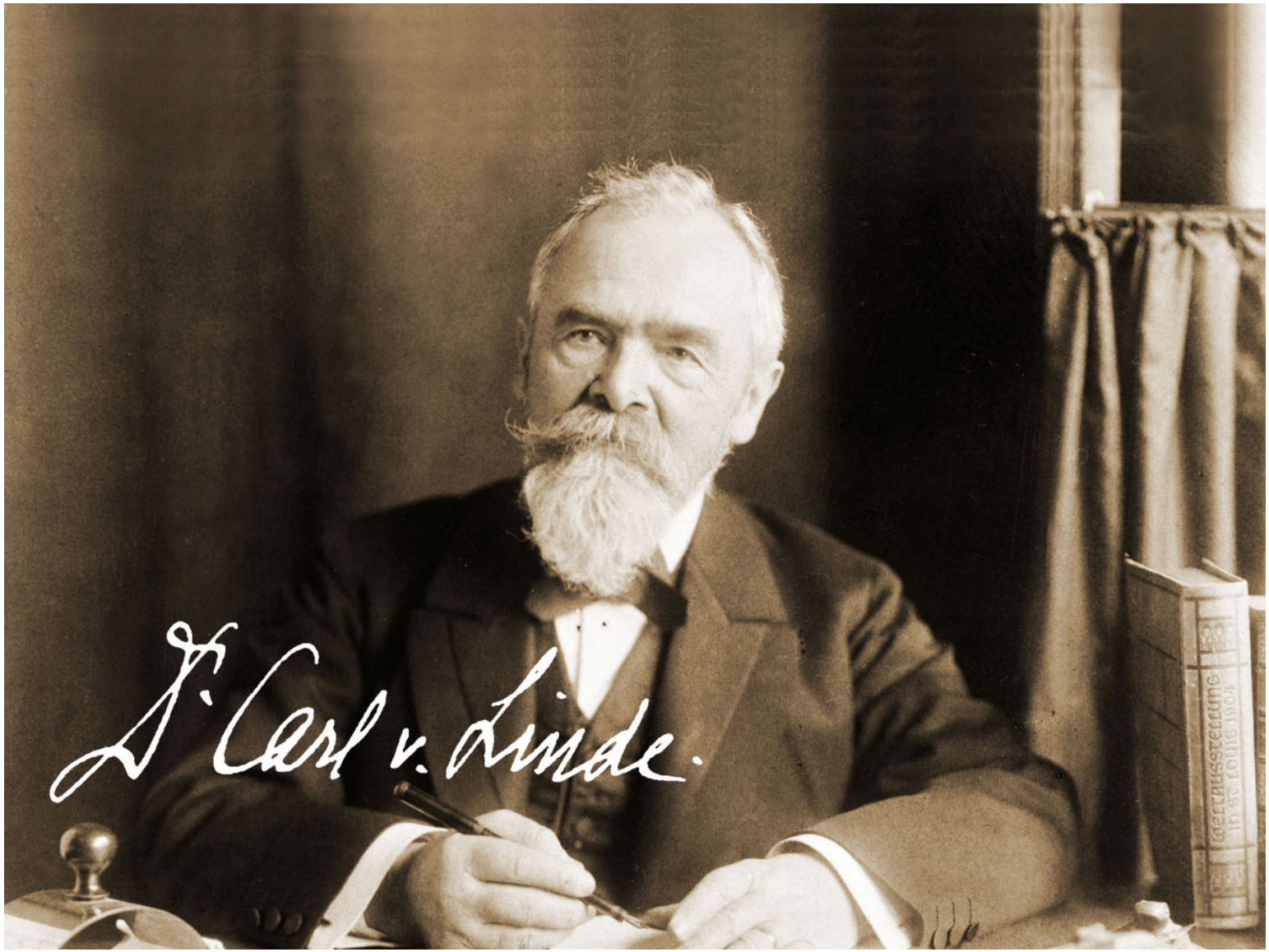
Hydrogen and Syngas

For the Chemical and Energy-Related Industries

Petrochemicals

Natural Gas

Linde History and 2021 Sales



- More than 140 years of history
- Operating in >100 countries worldwide
- 2021 sales: USD 31 billion

Vocational training programs in Germany
Introduction

- The **vocational training programs** at Linde in Germany have a long tradition and include
  - **apprenticeship programs**, which last between 2 and 3 ½ years, and
  - **dual study programs**, which last 3 years.

- They are based on the **German dual system of education**:
  - part of the time is spent at **vocational schools** or **cooperative state universities** for teaching theoretical foundations, and
  - part of the time is spent at the **company** for practical training.

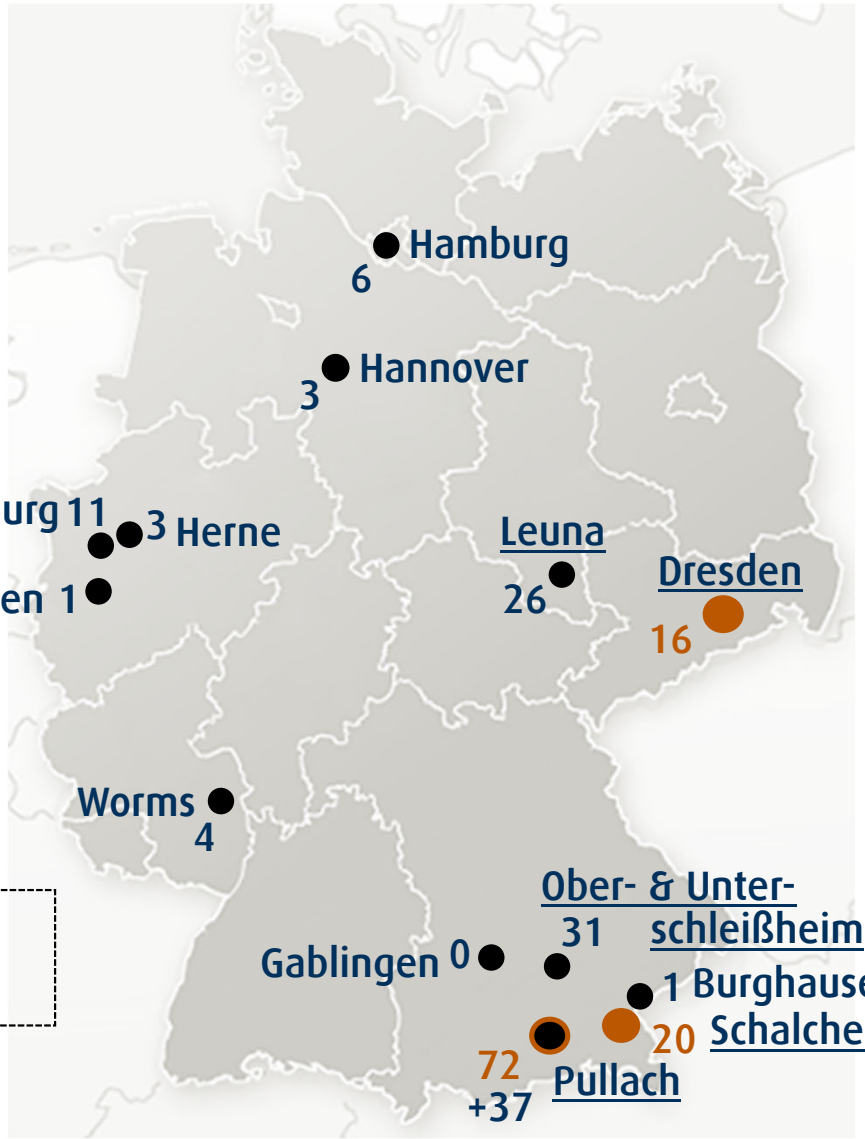
- Typically, **school leavers** of age between 16 and 19 years are recruited for these programs.

Apprentices and dual students (per 01.09.2022)

231 Apprentices and dual students

Vocational training quota: 4,1 %

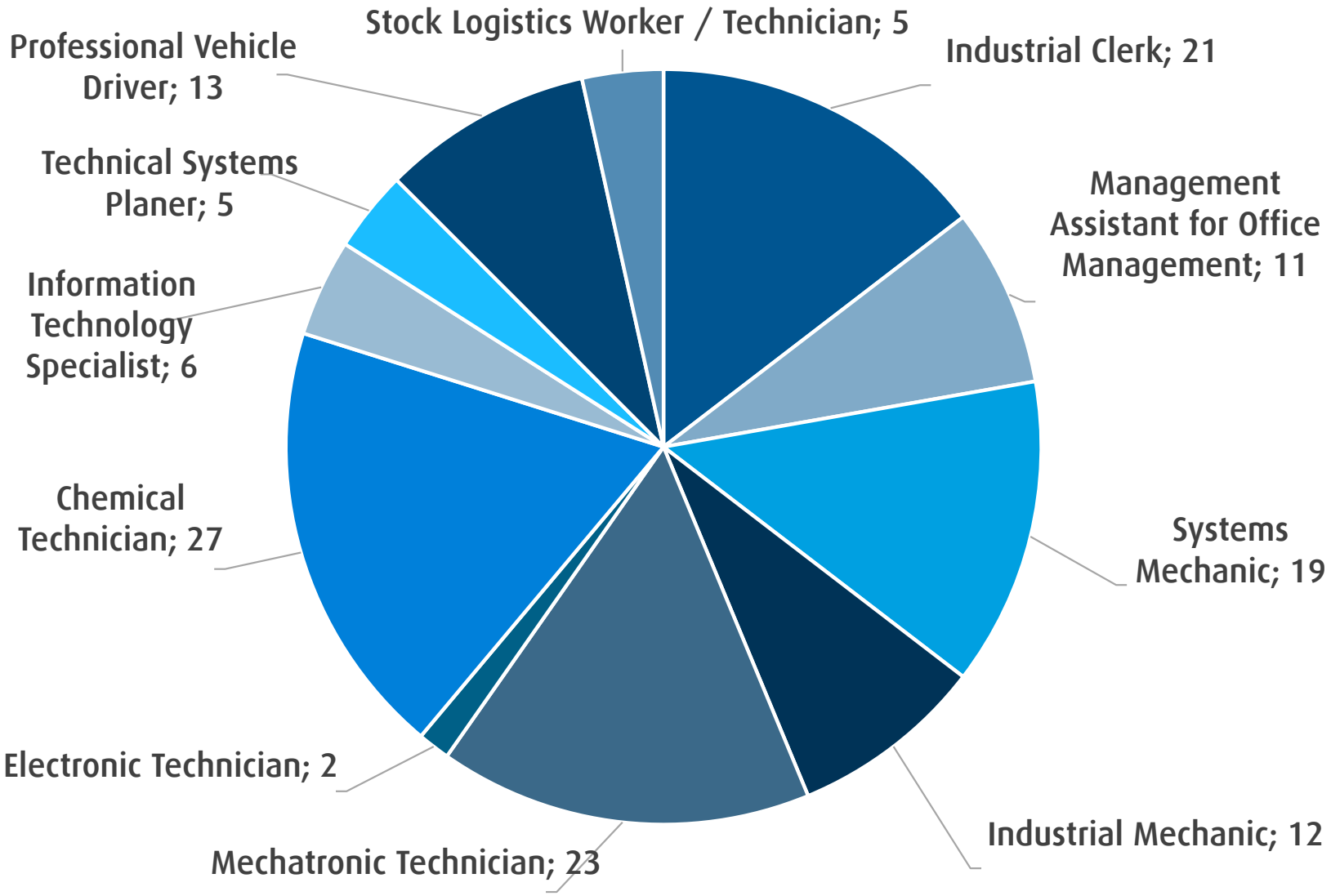
4,1 apprentices / dual students
per 100 employees



Linde Gas and Corporate Office: 123
Linde Engineering: 108

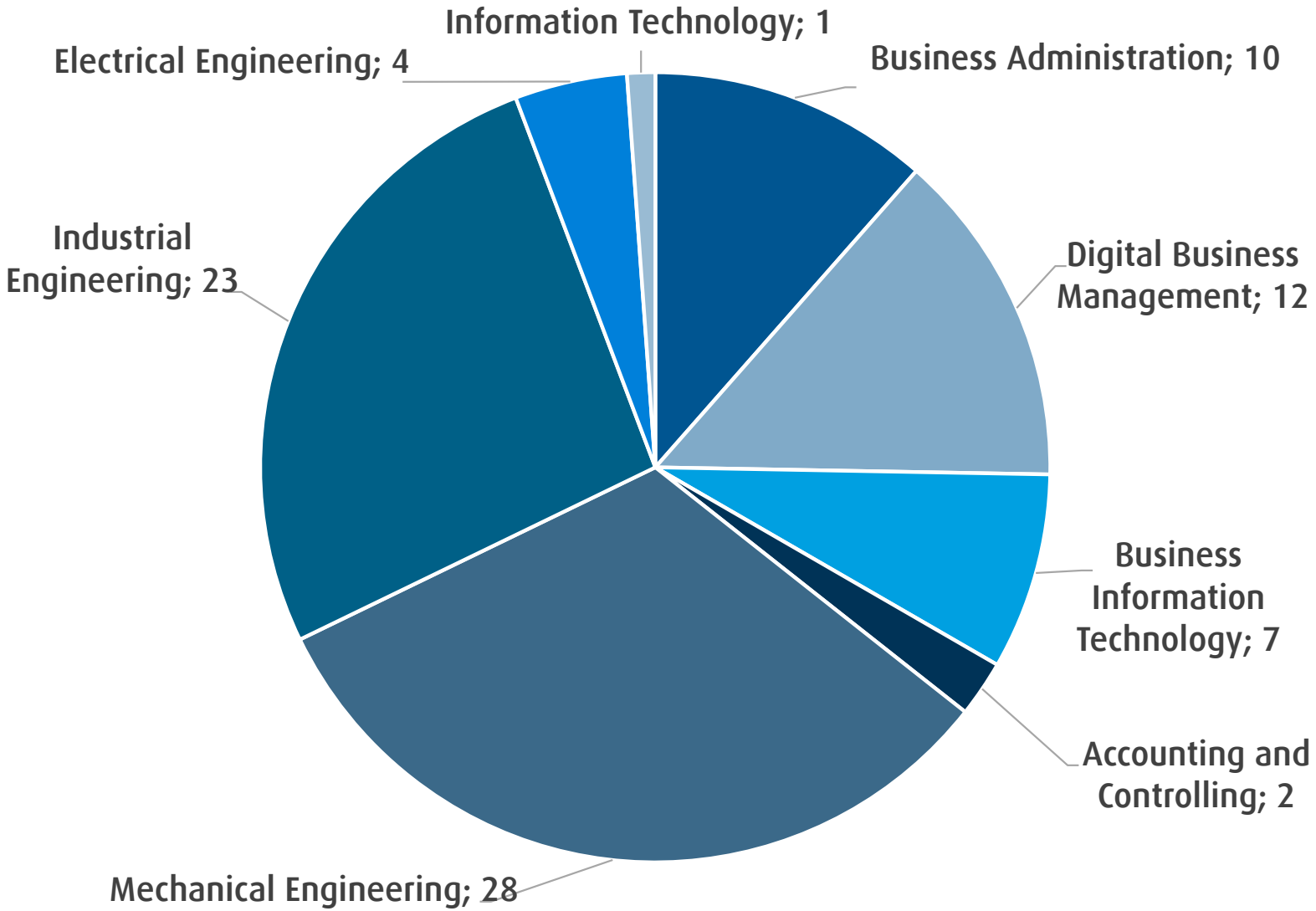
Apprenticeship programs (per 01.09.2022)

144 Apprentices



Dual study programs (per 01.09.2022)

87 Dual Students

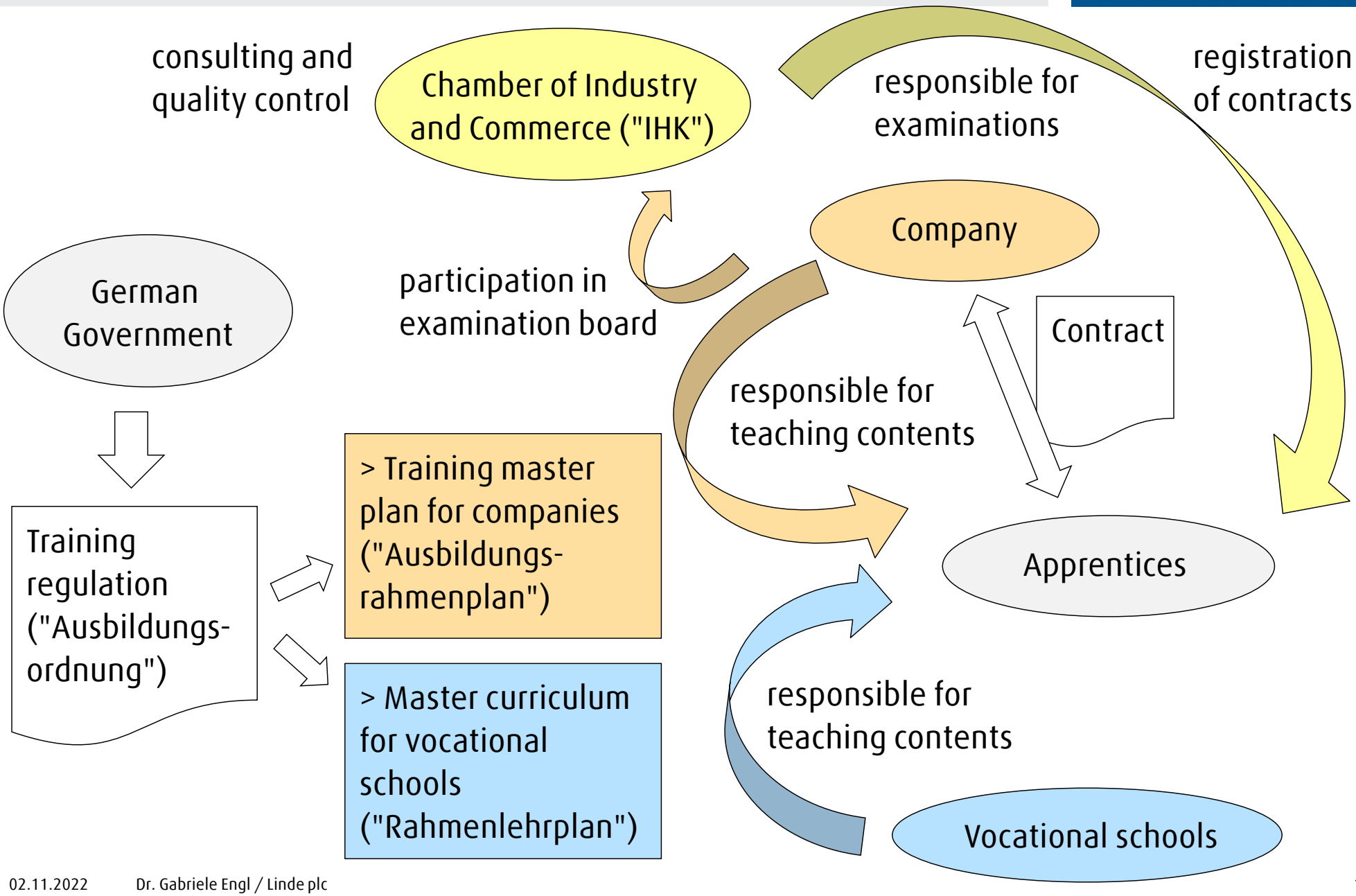


Benefits and Costs

- **Benefits** are
  - **availability of junior staff** especially in case of shortage on the market
  - training of **Linde-specific know-how**
  - good **integration** and strong **commitment** (retain talent)
  - increasing **productiveness** during dual training program – due to integration and work in the departments; high productiveness after finishing the dual training program

- **Costs** are
  - **wages** for apprentices and students
  - **wages** for full-time training team; capacity of training and supervising personnel in the departments
  - **non-personnel costs** such as training facilities, outfit, fees (e.g. IHK), expenses for external training and travelling, etc.

Roles and responsibilities



Example for apprenticeship program
Mechatronic Technicians - Basic characteristics

Candidates:
Graduates from school

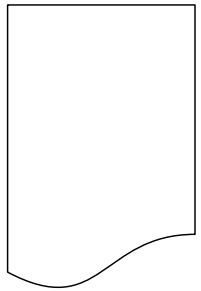
Duration of training:
3 ½ years

Venues for training:
— company
— external training partner
— part-time vocational school

Professional profile:
– Skilled workers, combining metal working skills with electrical and IT knowledge
– Fabrication and maintenance of plants, facilities and components for the production, transport, storage and technical applications of gases

Example for apprenticeship program
Mechatronic Technicians - Contents of training

Training regulation ("Ausbildungsordnung")



Job profile with qualifications

1. Berufsbildung, Arbeits- und Tarifrecht,
2. Aufbau und Organisation des Ausbildungsbetriebes,
3. Sicherheit und Gesundheitsschutz bei der Arbeit,
4. Umweltschutz,
5. Betriebliche und technische Kommunikation,
6. Planen und Steuern von Arbeitsabläufen, Kontrollieren und Beurteilen der Arbeitsergebnisse,
7. Qualitätsmanagement,
8. Prüfen, Anreißen und Kennzeichnen,
9. Manuelles und maschinelles Spanen, Trennen und Umformen,
10. Fügen,
11. Installieren elektrischer Baugruppen und Komponenten,
12. Messen und Prüfen elektrischer Größen,
13. Installieren und Testen von Hard- und Softwarekomponenten,
14. Aufbauen und Prüfen von Steuerungen,
15. Programmieren mechatronischer Systeme,
16. Zusammenbauen von Baugruppen und Komponenten zu Maschinen und Systemen,
17. Montieren und Demontieren von Maschinen, Systemen und Anlagen; Transportieren und Sichern,
18. Prüfen und Einstellen von Funktionen an mechatronischen Systemen,
19. Inbetriebnehmen und Bedienen mechatronischer Systeme,
20. Instandhalten mechatronischer Systeme.

11. Install electrical construction groups and elements

Training master plan ("Ausbildungsrahmenplan")

11	Installieren elektrischer Baugruppen und Komponenten (§ 3 Absatz 2 Nummer 11)	a) Einschübe, Gehäuse und Schaltgerätekombinationen zusammenbauen
		b) Komponenten für elektrische Hilfs- und Schalteinrichtungen auswählen, einbauen, verbinden und kennzeichnen
		c) Komponenten zum Steuern, Regeln, Messen und Überwachen einbauen und kennzeichnen
		d) Leitungswege nach baulichen und örtlichen Gegebenheiten festlegen
		e) Leitungen unter Berücksichtigung der mechanischen und elektrischen Belastung, der Verlegungsarten und des Verwendungszweckes auswählen, zurichten, verlegen und verbinden

c) Assemble and mark components for operating, measuring and controlling

Example for apprenticeship program
Mechatronic Technicians - Training venues

Vocational school (1/3)

Basic training (2/3)

Extended training / operational training (2/3)

Final examination Part 1

Final examination Part 2

Inhouse training workshop and/or external training provider
> manual skills
> use of machines
> electrical skills

Business departments

Kalenderwoche	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
2. Ausbildungsjahr			P	P																	
[redacted]	LW	S	LW	LW	LW	TTZ	S	TTZ	LGT	S	TTN	TTS	TSI	TTA	S	TTP	LW	TSA	LGT	LGT	TTZ
[redacted]	LW	S	LW	LW	LW	TTS	S	TTS	TTA	S	TTH	LGT	TTA	TTZ	S	TTA	LW	TTS	TTP	TTH	TTN
[redacted]	LW	S	LW	LW	LW	TSA	S	TSA	TTA	S	TTZ	TTN	TTH	TTP	S	TTS	LW	TTA	TTN	TTZ	LGT
[redacted]	Lw	S	Lw	Lw	Lw	LGT	S	LGT	TSI	S	TSA	TTA	TSA	TTN	S	TTN	Lw	TTZ	TTH	TTS	TTP
[redacted]	Lw	S	LW	LW	Lw	TTA	S	TTA	TTN	S	TTH	TTS	TTZ	TTS	S	LGT	LW	TTP	TSA	TSA	TTH

Kalenderwoche	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
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[redacted]	S	TTZ	TTZ	LGT	LW	S	TTA	TTP	S	TTP	TTZ	TTH	TTN	S	TSI	TSA	S	TTN	TTS	TTH	TTH
[redacted]	S	LW	TSA	TTA	TTP	S	TTP	TTN	S	TTN	TTN	TSI	LGT	S	TTA	TTH	S	TTH	TTZ	TTZ	TTZ
[redacted]	S	TTP	LGT	TTP	TTZ	S	TTZ	TTH	S	TTH	TTN	TSA	TTN	S	TTN	TTH	S	TSI	TTA	TTA	TTZ
[redacted]	S	TTA	LW	TTH	TTH	S	TTH	TTH	S	TTS	LGT	TTP	TSI	S	TSA	TTZ	S	TTZ	TTP	TTN	TTN
[redacted]	S	TTZ	TTP	TTS	TTA	S	TSA	TTN	S	TTN	TTP	TTZ	TTH	S	TTH	LGT	S	TTH	TTN	TSI	TTA

Training plan

Example for dual study program
Industrial Engineering – Basic characteristics

Candidates:
Graduates from high school

Duration of training:
3 years

Venues for training:
— company
— cooperative state university

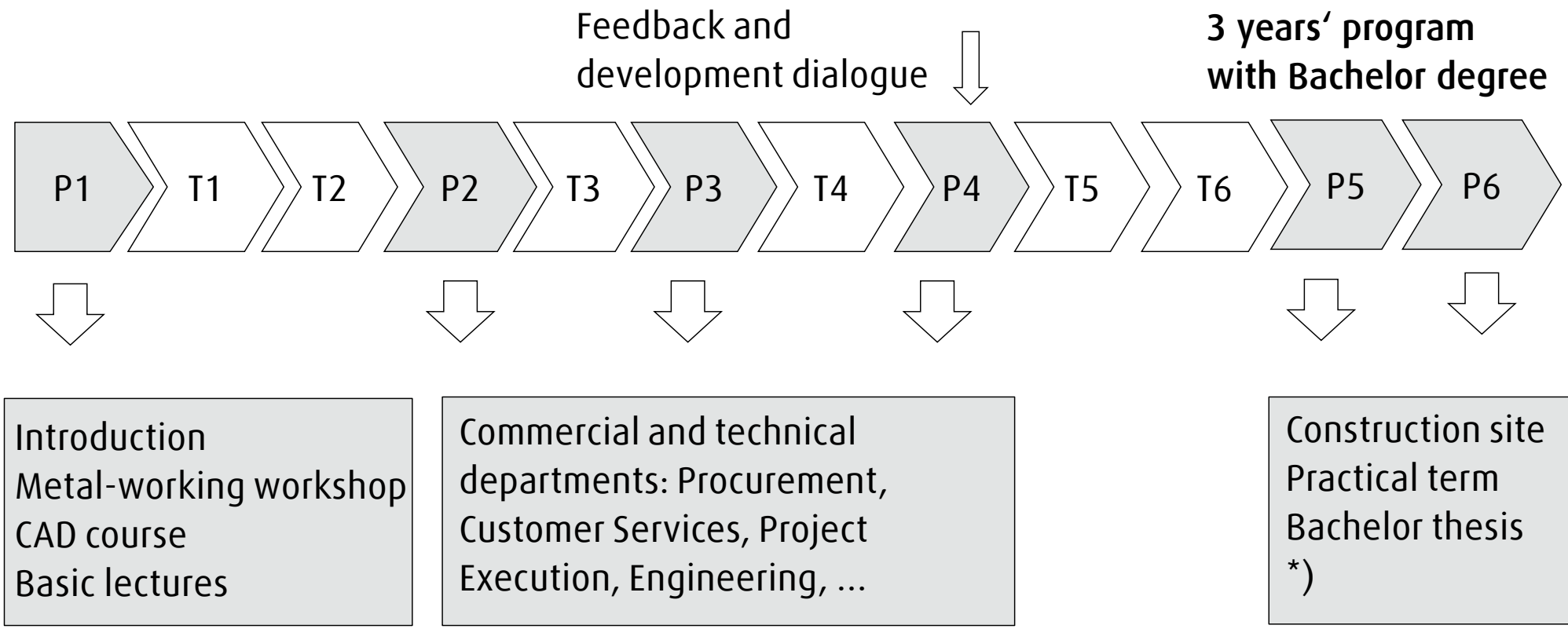
Professional profile (as Bachelor of Engineering)

- **Linde Engineering**

  e.g. procurement, project planning & controlling, contract management, customer service

- **Linde Gas**
  - Customer engineering & service: planning, supply and maintenance of plants
  - Gas production: plant operation
  - Cylinder operations: engineering, commissioning and start-up of cylinder filling facilities

Example for dual study program
Industrial Engineering - Overview of schedule



*) depending on business demand and interests of students

P1, P2, ... Practical terms in Linde business departments

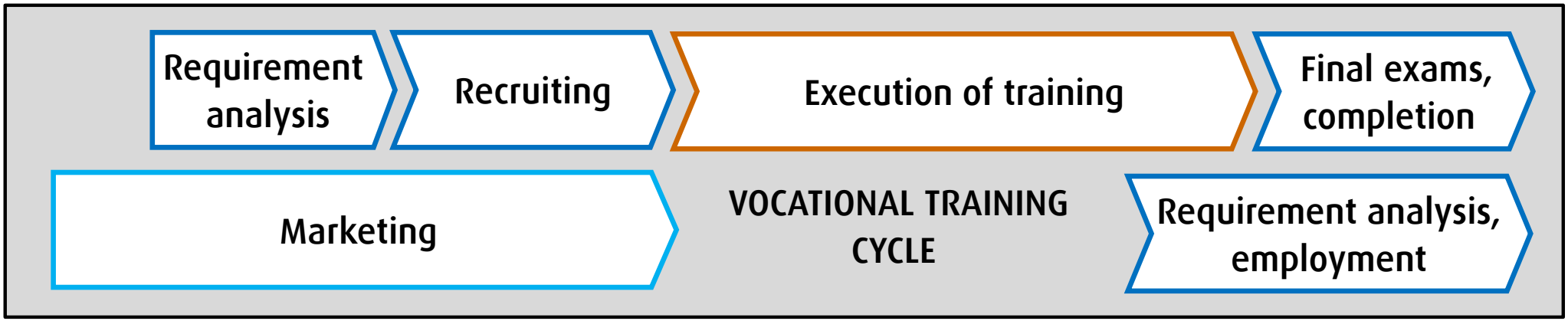
T1, T2, ... Theoretical terms at Cooperative State University Baden-Württemberg (3 months each)

Key processes and challenges

Workforce planning for demand in 3 ½ - 5 years

Young talent attraction in a competitive market environment

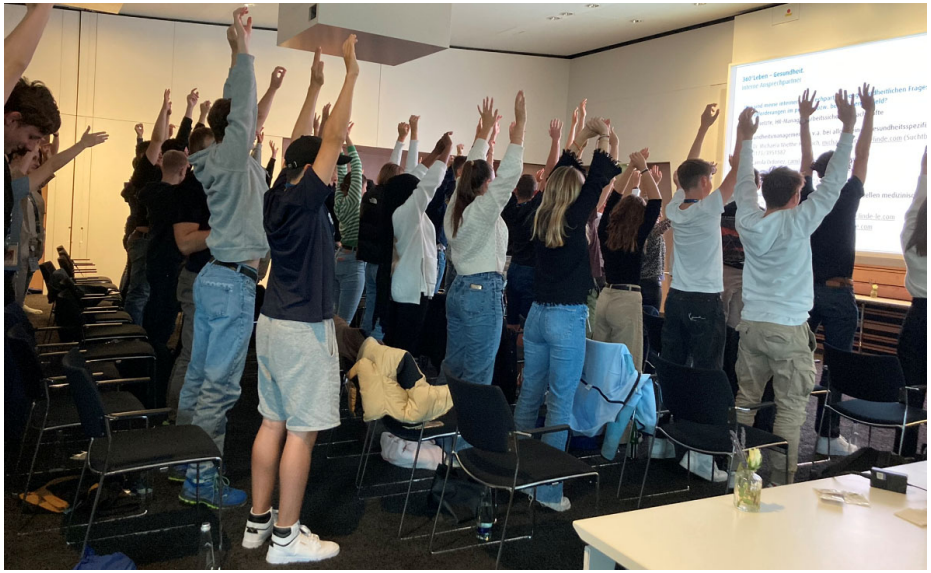
Capacity of supervising staff in the business departments;
balance between training effort („input“) and benefit by work contribution („output“)



Optimal choice/mix of marketing initiatives („efficiency“)

Matching between open positions and graduates;
motivation for mobility;
long term retention

Impressions: Marketing / Internships & Diversity / Health Management / Digitalisation & VR



Thank you very much for your attention.

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Making our world more productive