



SADC ENGINEERING NEEDS AND NUMBERS STUDY

ADDRESSING ENGINEERING – THE CRITICAL PROFESSION FOR INFRASTRUCTURE DELIVERY AND ECONOMIC GROWTH IN THE SADC REGION

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**science
& technology**

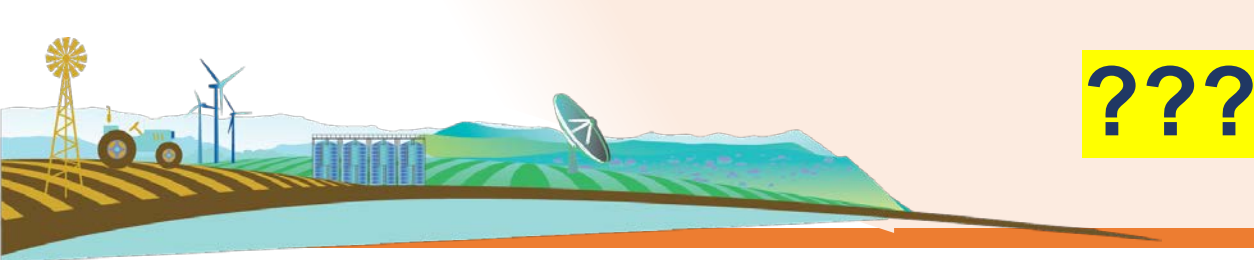
Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA





OBJECTIVES

- The overall objective of the study is to get a better understanding of the Engineer, Engineering Technologist and Engineering Technician capacities in the SADC region to allow for better planning and implementation of infrastructure programmes to support the SADC Industrialisation Strategy (2015-2063).
- The SADC Industrialisation Strategy identifies lack of adequate infrastructure and lack of adequate skills and capacities in science, technology, engineering and mathematics (STEM) as among the binding constraints for industrial development. The outcomes of the study will also serve as input towards the implementation of key SADC policies and frameworks such as the SADC Master Plan on Infrastructure Development, Protocol on Education and Training and Protocol on Science, Technology and Innovation.



- The Joint Ministerial meeting on Education and Training and Science, Technology and Innovation of June 2017 which was held in Ezulwini, Swaziland received a progress report on the implementation of the study, which is being coordinated by a Technical Working Group comprising of the following Member States – Botswana, Lesotho, Namibia, South Africa, Zambia and Zimbabwe, supported by the SADC Secretariat



UNIDO HIGH LEVEL LIST

- Manufacturing
- Electricity, gas, steam & conditioning supply
- Water supply; sewerage, waste management & remediation activities
- Construction
- Wholesale & retail trade; repair of motor vehicles & motorcycles
- Transportation & storage
- Information & communication
- Professional, scientific & technical activities



REGISTERING BODIES & VAS

- Professional registration
- Construction & consulting
- Manufacturing



GRADUATION STATISTICS

- Total number of graduate engineers, technologists & technicians per gender, per year, per engineering discipline from 2005 to 2015
- Total number of foreign students who graduate in engineering per home country and discipline
- Information about the qualifications for engineers, technologists and technicians per discipline
 - Name of the qualification
 - What year the qualification was first offered at your institution?
 - No of years of theoretical training
 - No of years of internship/ placement in industry (if any)?
 - Offered full-time (F), part-time (P) or distance learning (D)
 - Qualification recognised under the Washington Accord?
 - Have applied for recognition under the Washington Accord?
 - Number of staff in department(s)
 - % vacancies in department(s)
- Total number of ALL graduates, technologists and technicians completing a professional degree at a specific institution in 2015 (i.e. including non-engineering courses)



DATA PER ORGANISATION

- Developing and attracting suitable engineering staff
 - Does the organisation provide bursaries for engineering students?
 - If yes, how many are currently funded per annum?
 - Does your organisation offer structured training for engineering graduates?
 - If yes, how many are currently taken on per annum?
 - Do you have difficulty in sourcing suitable engineering staff?
 - If yes, what are the causes, and how can they be overcome?
 - How many vacancies, if any exist, for the following?
 - Category: engineers, technologists, technicians
 - What are the main roles/activities carried out by your engineers, technicians and technologists?
 - If the organisation have limited inhouse engineering staff, & use external providers, please indicate the type of engineers used & the services they provide



DATA PER ORGANISATION

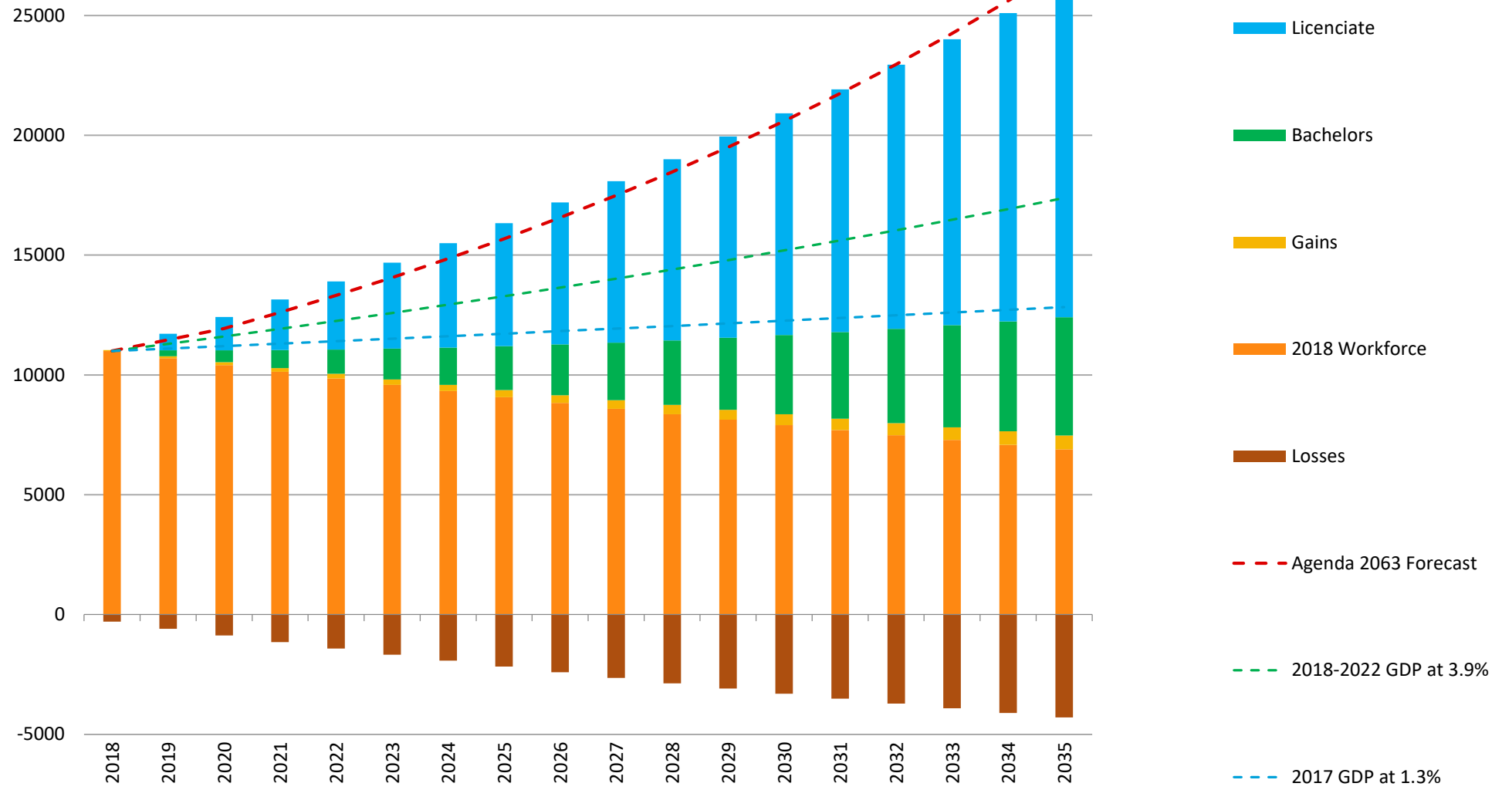
- Demographics:
 - Engineering disciplines
 - Engineers, technologists & technicians
 - Gender
- Universities:
 - List the main universities from which your organisation recruits graduate engineers, technologists and technicians?
 - Is there adequate supply coming from universities?
 - If not, what interventions are necessary to address the challenges?
 - Are you happy with their training?
- Country of origin?
 - What percentage of your staff are foreign?
 - If you employ foreign staff, please list the top four countries from which you recruit for each category of engineer, technologist and technician
- What major developments are planned, or targets must be achieved, if any?

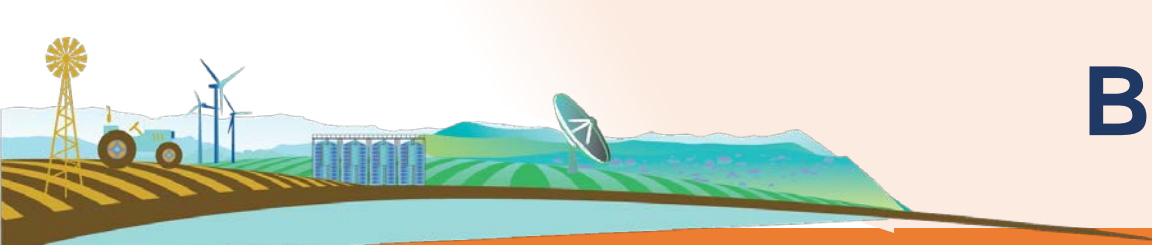




ANGOLA FLOW OF SKILLS

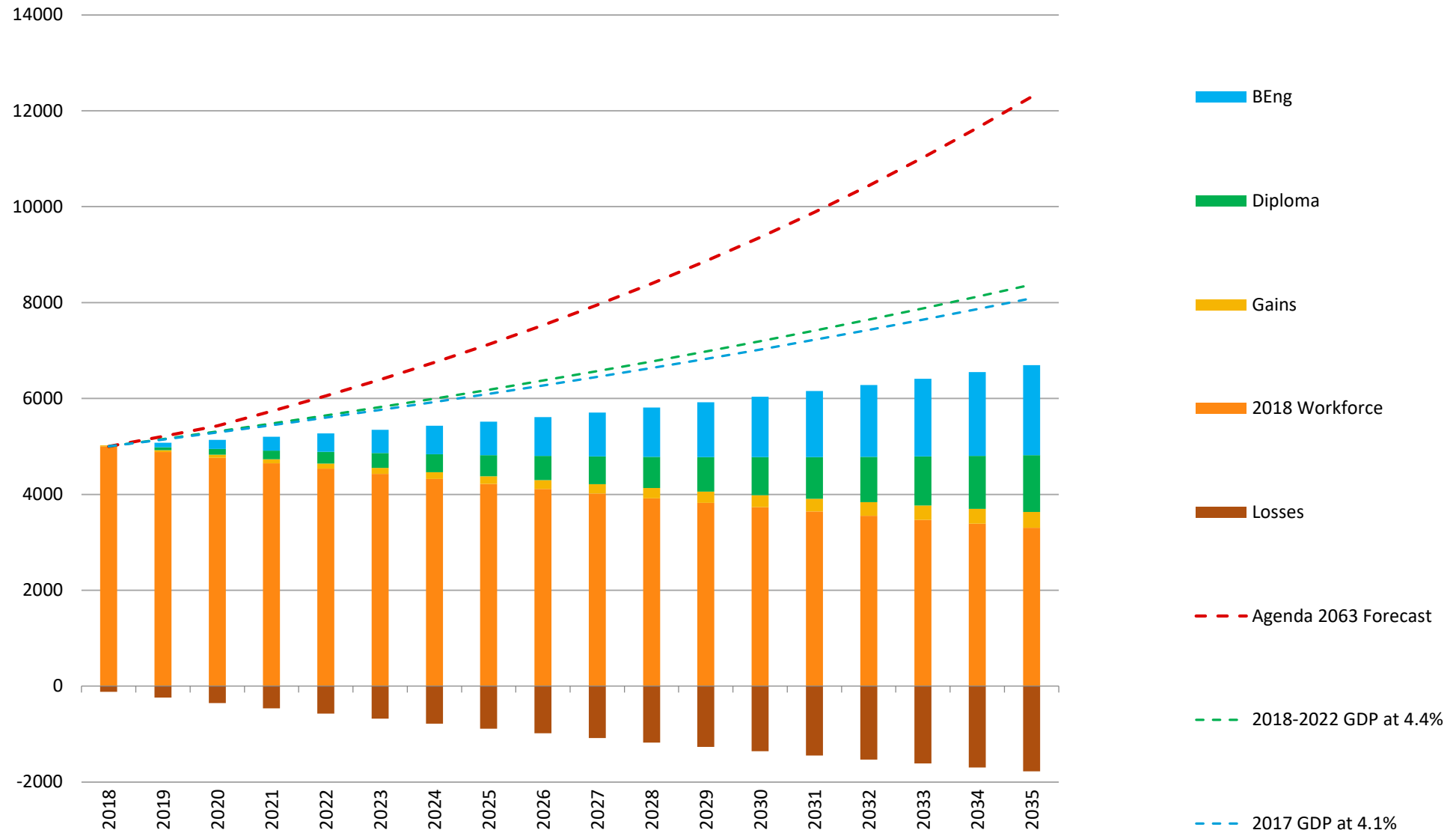
- Workforce – 11 000
- Graduate engineers – 700
- Graduate technicians – 250

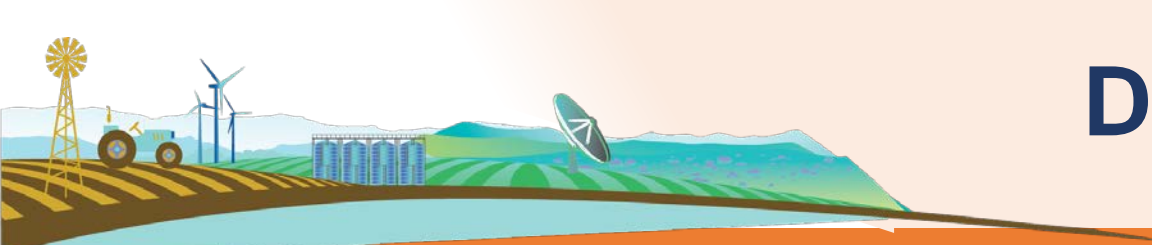




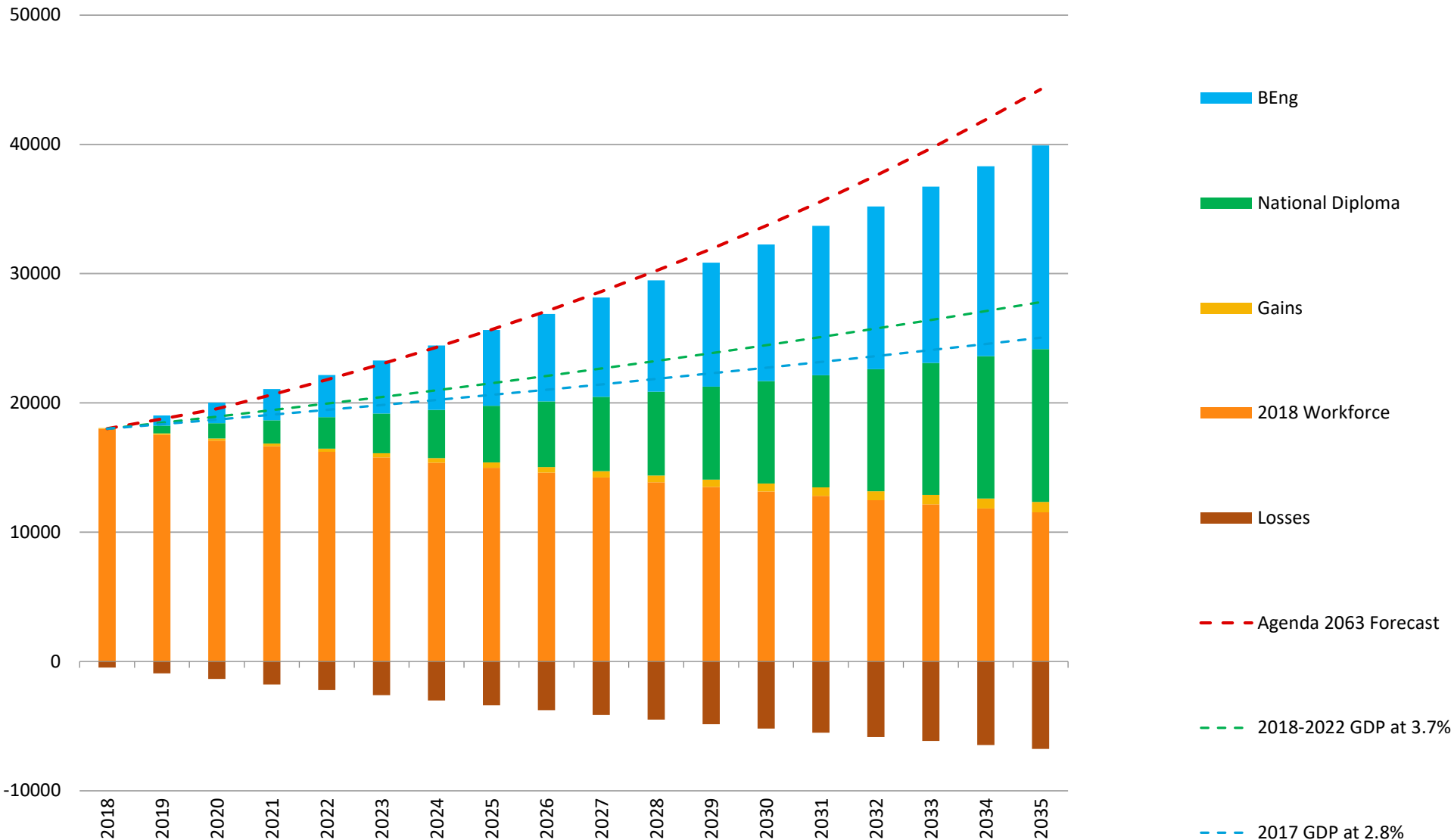
BOTSWANA FLOW OF SKILLS

- Workforce – 5 000
- Graduate engineers – 95
- Graduate technicians – 60





DRC FLOW OF SKILLS

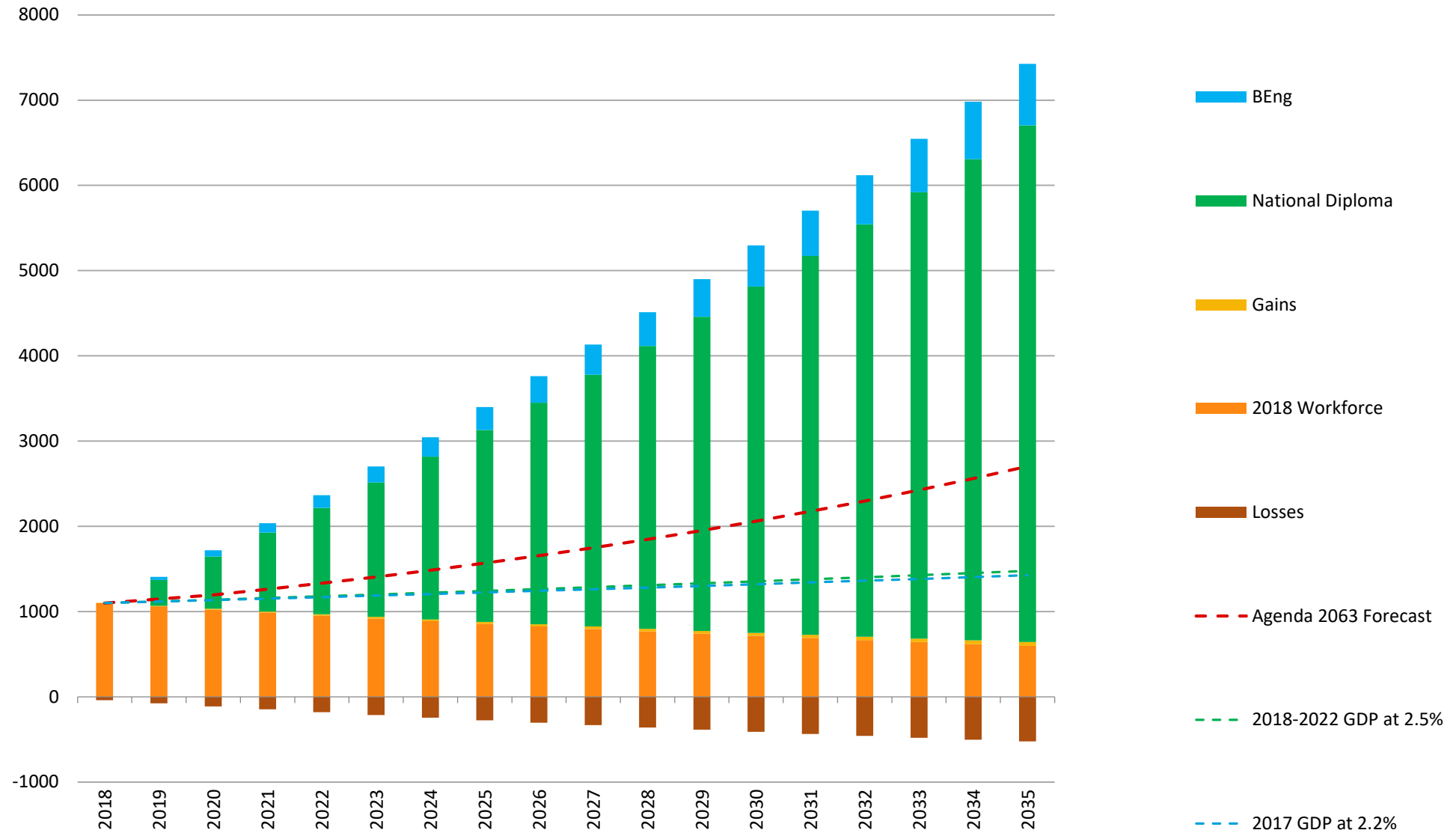


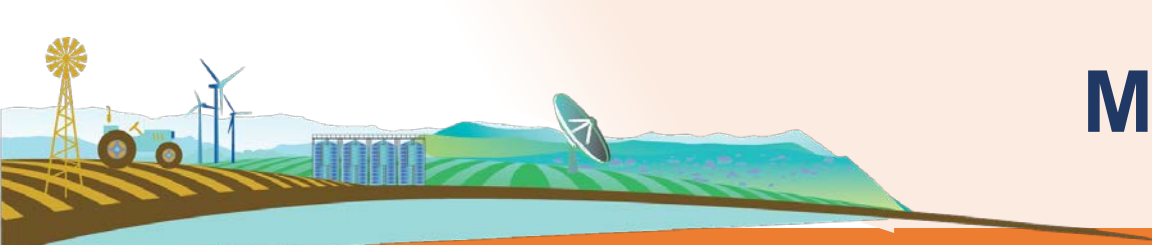
- Workforce – 18 000
- Graduate engineers – 800
- Graduate technicians – 600



LESOTHO FLOW OF SKILLS

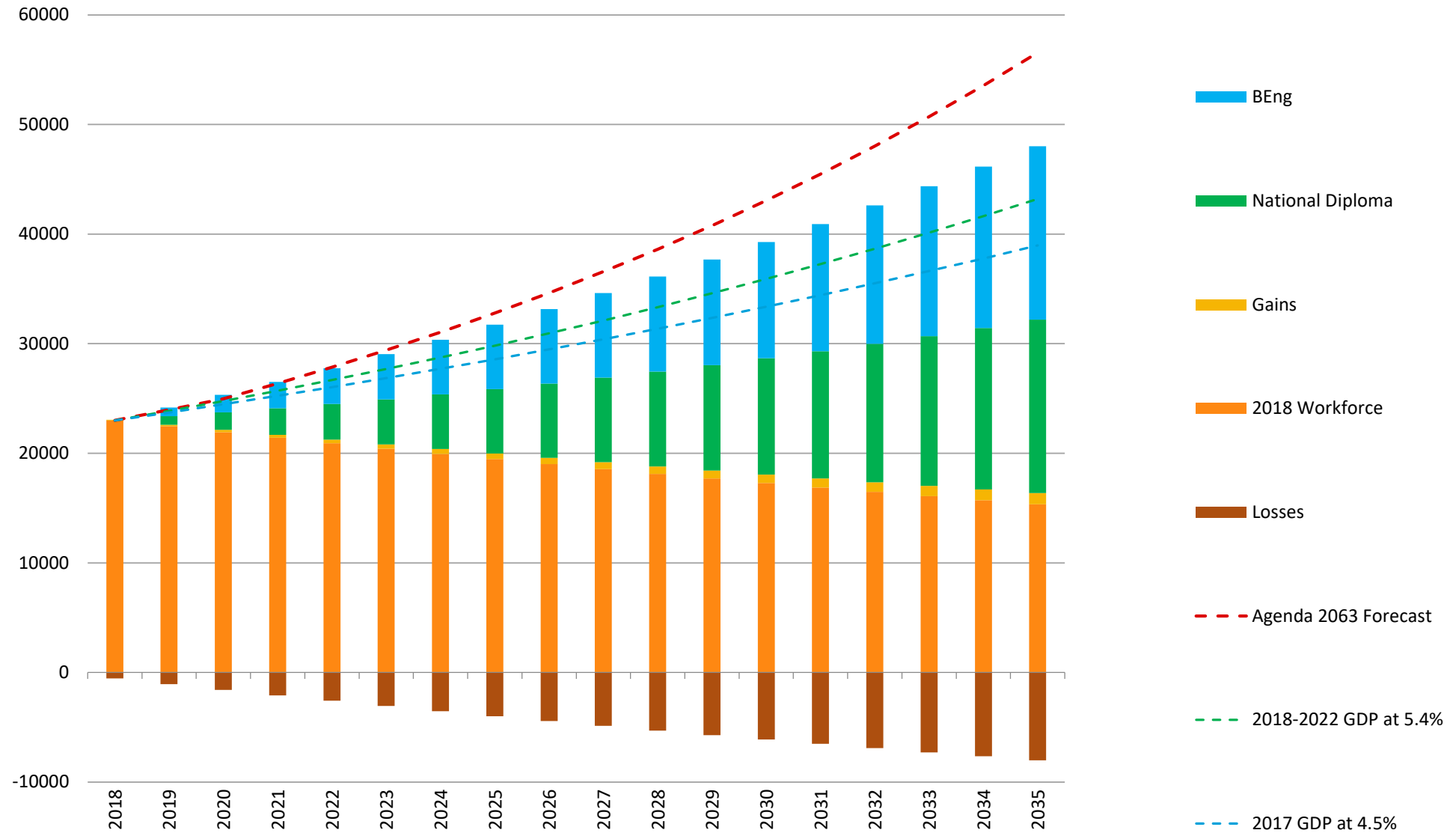
- Workforce – 1 100
- Graduate engineers – 37
- Graduate technicians – 310





MADAGASCAR FLOW OF SKILLS

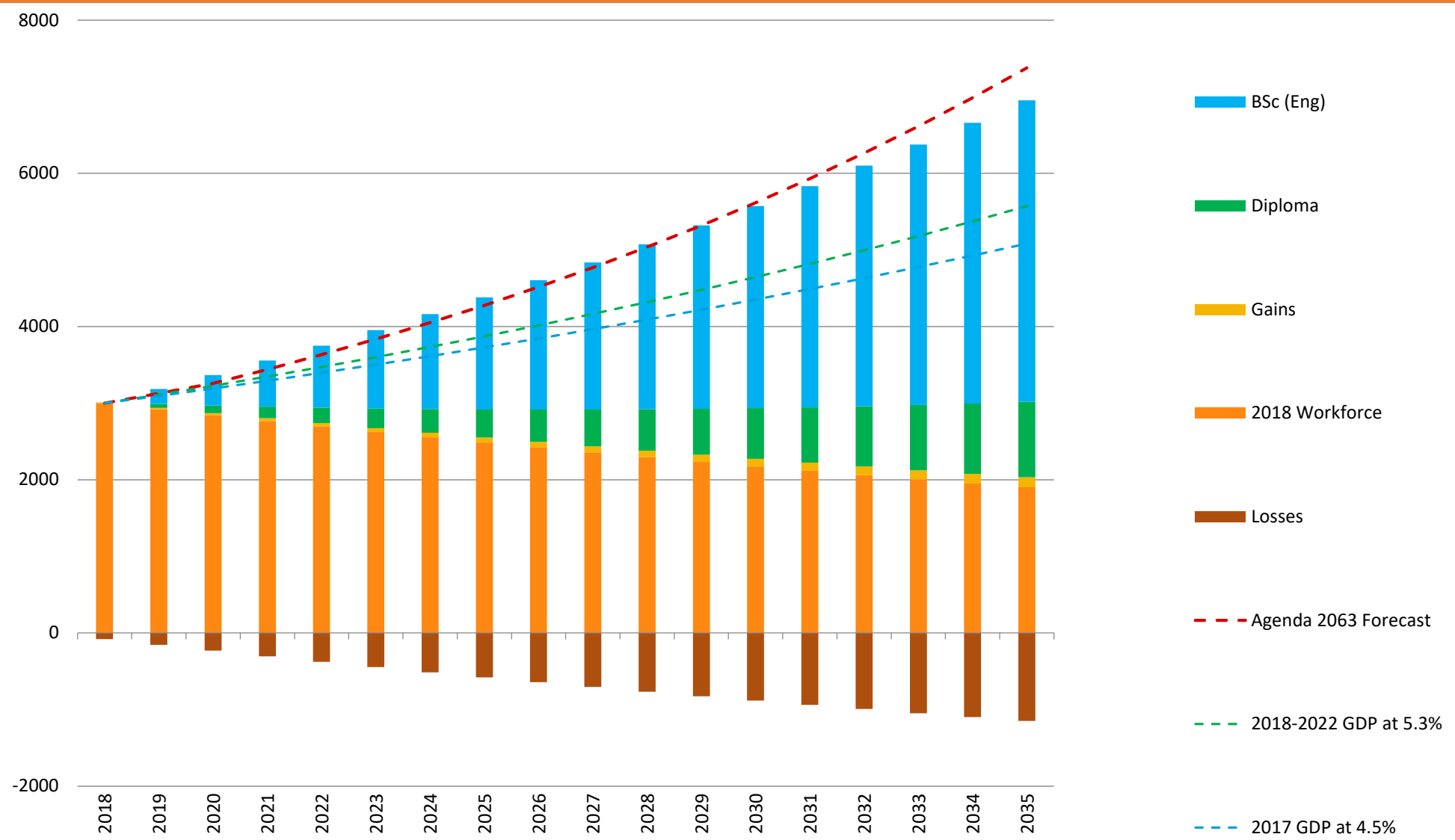
- Workforce – 23 000
- Graduate engineers – 800
- Graduate technicians – 800





MALAWI FLOW OF SKILLS

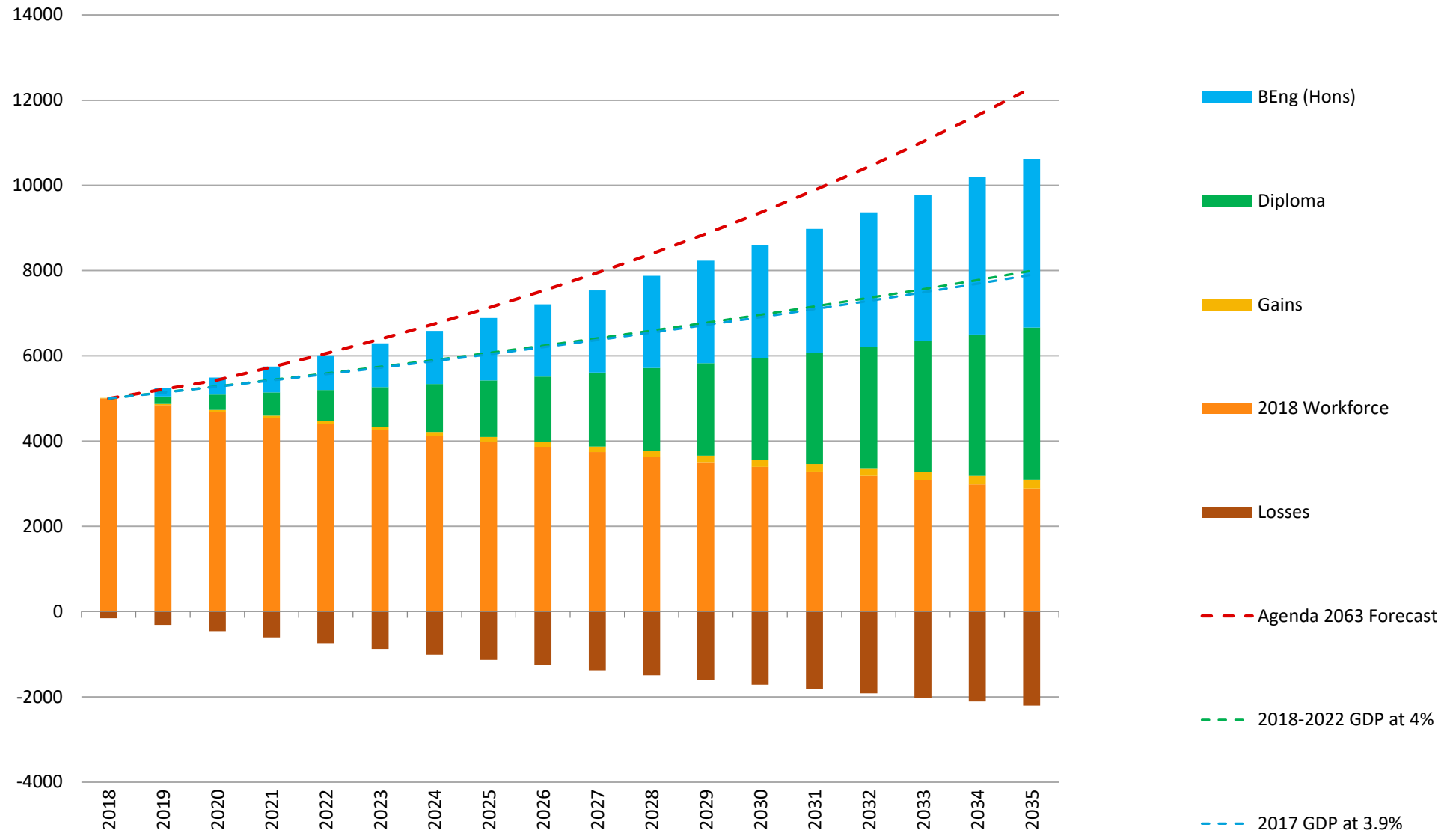
- Workforce – 3 000
- Graduate engineers – 200
- Graduate technicians – 50

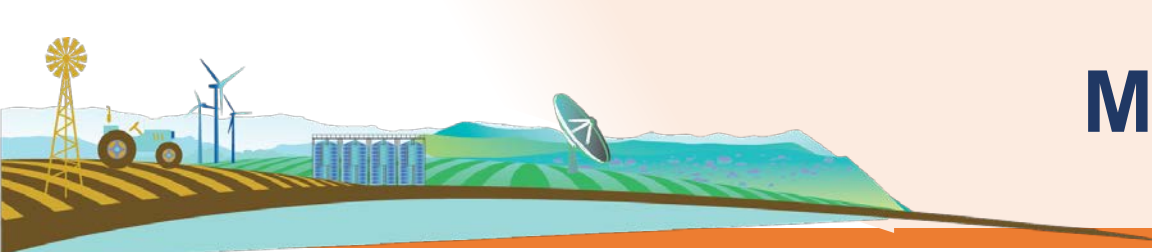




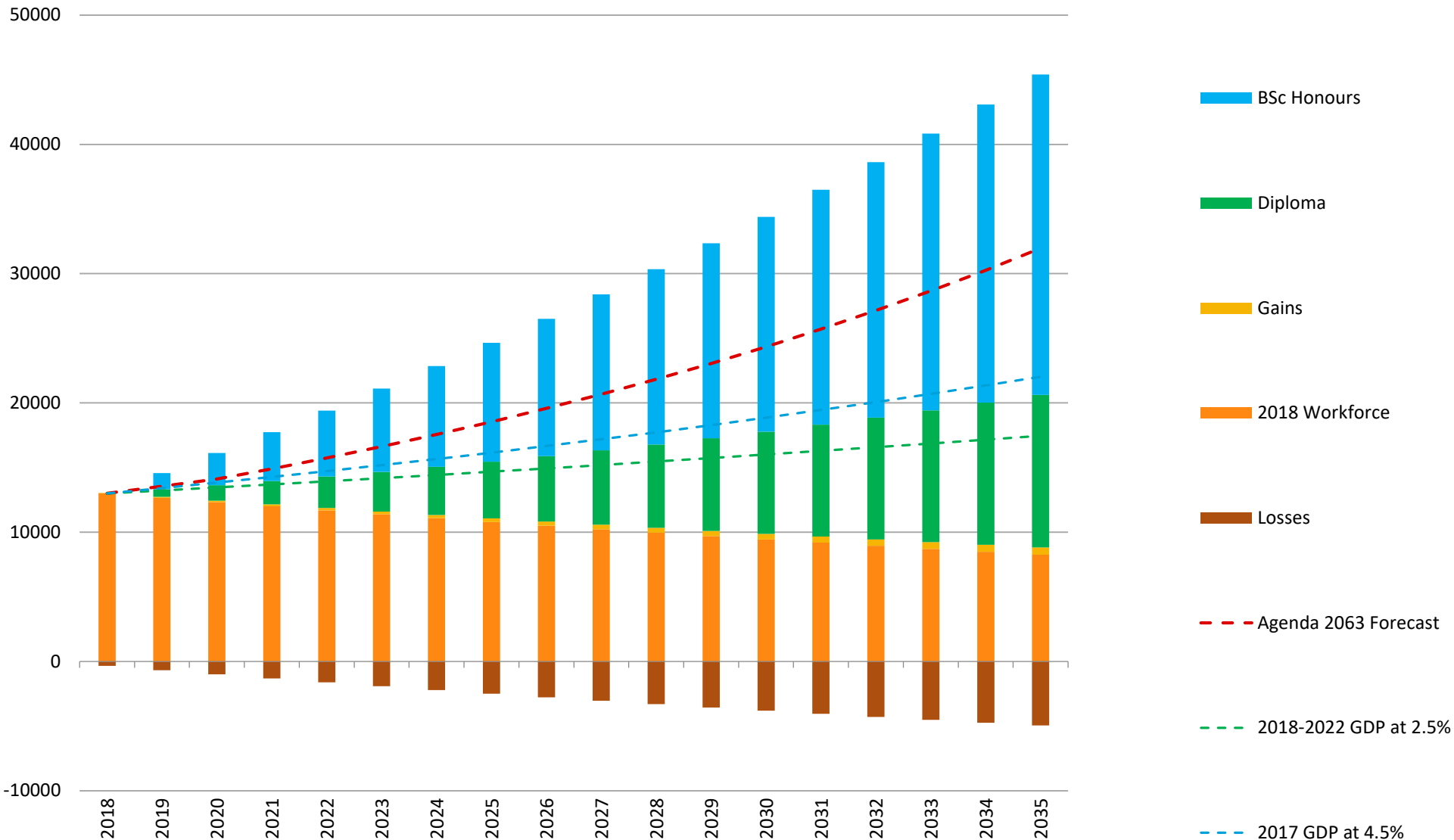
MAURITIUS FLOW OF SKILLS

- Workforce – 5 000
- Graduate engineers – 200
- Graduate technicians – 180



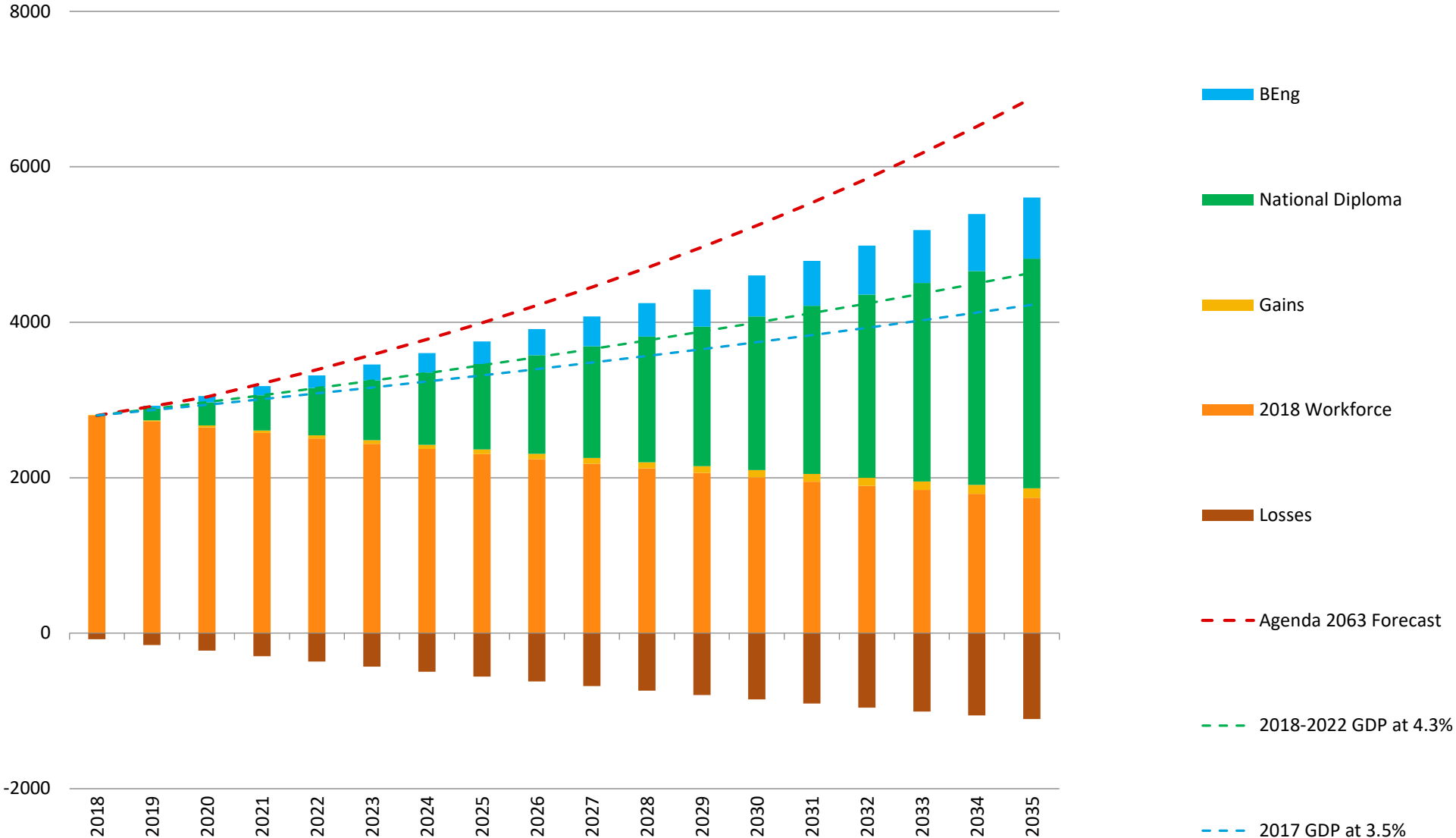
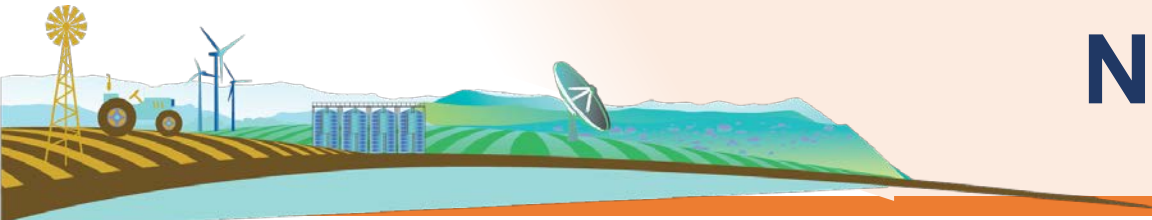


MOZAMBIQUE FLOW OF SKILLS

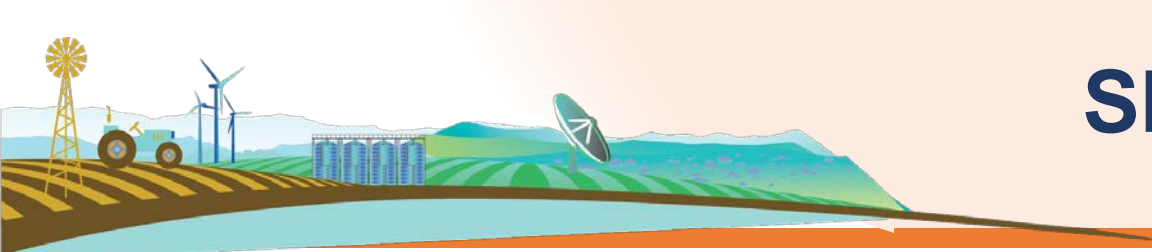


- Workforce – 13 000
- Graduate engineers – 1 260
- Graduate technicians – 600

NAMIBIA FLOW OF SKILLS

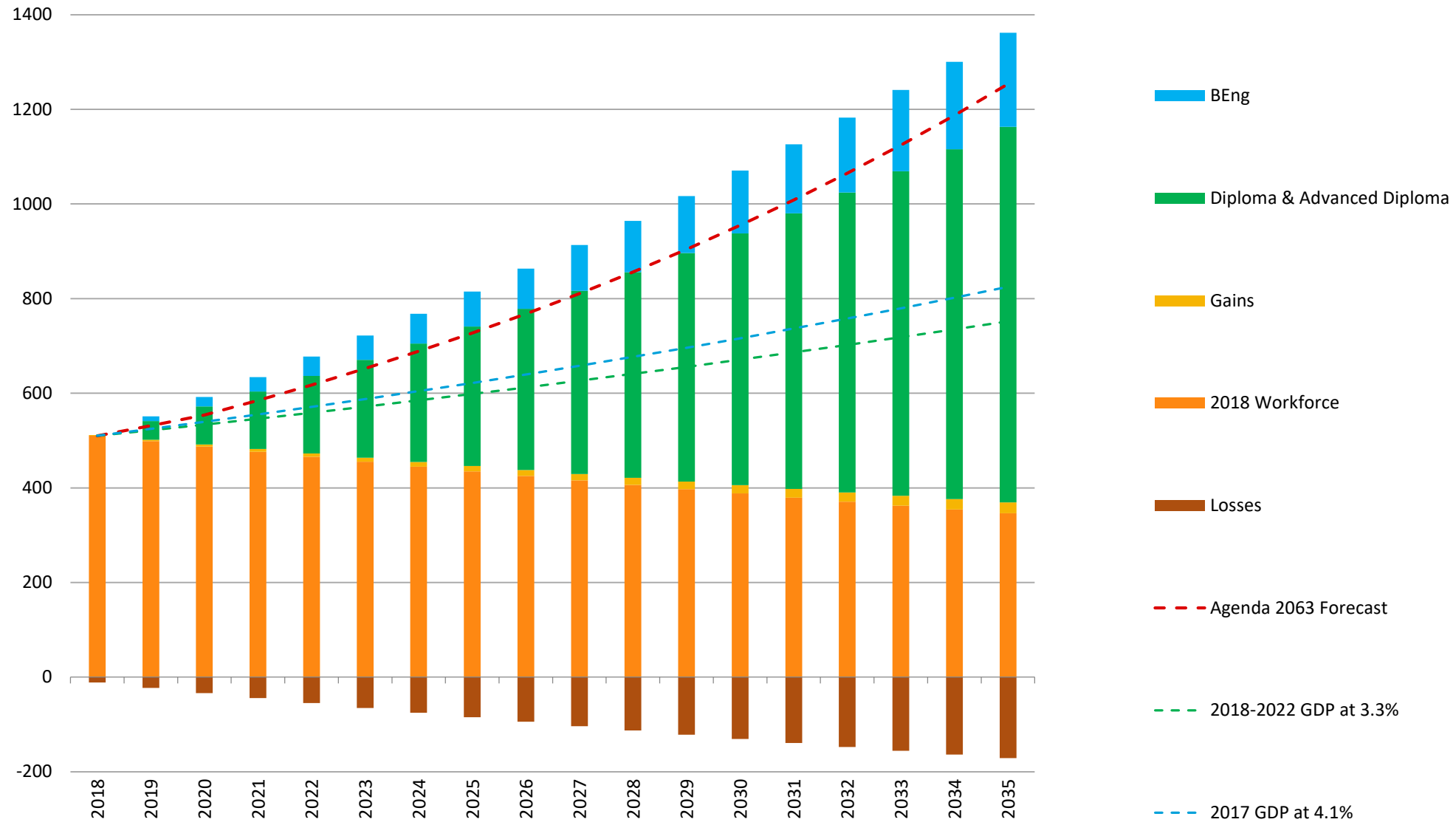


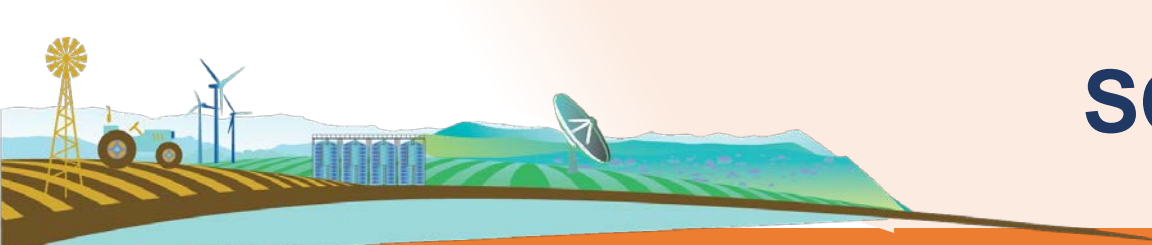
- Workforce – 2 800
- Graduate engineers – 40
- Graduate technicians – 150



SEYCHELLES FLOW OF SKILLS

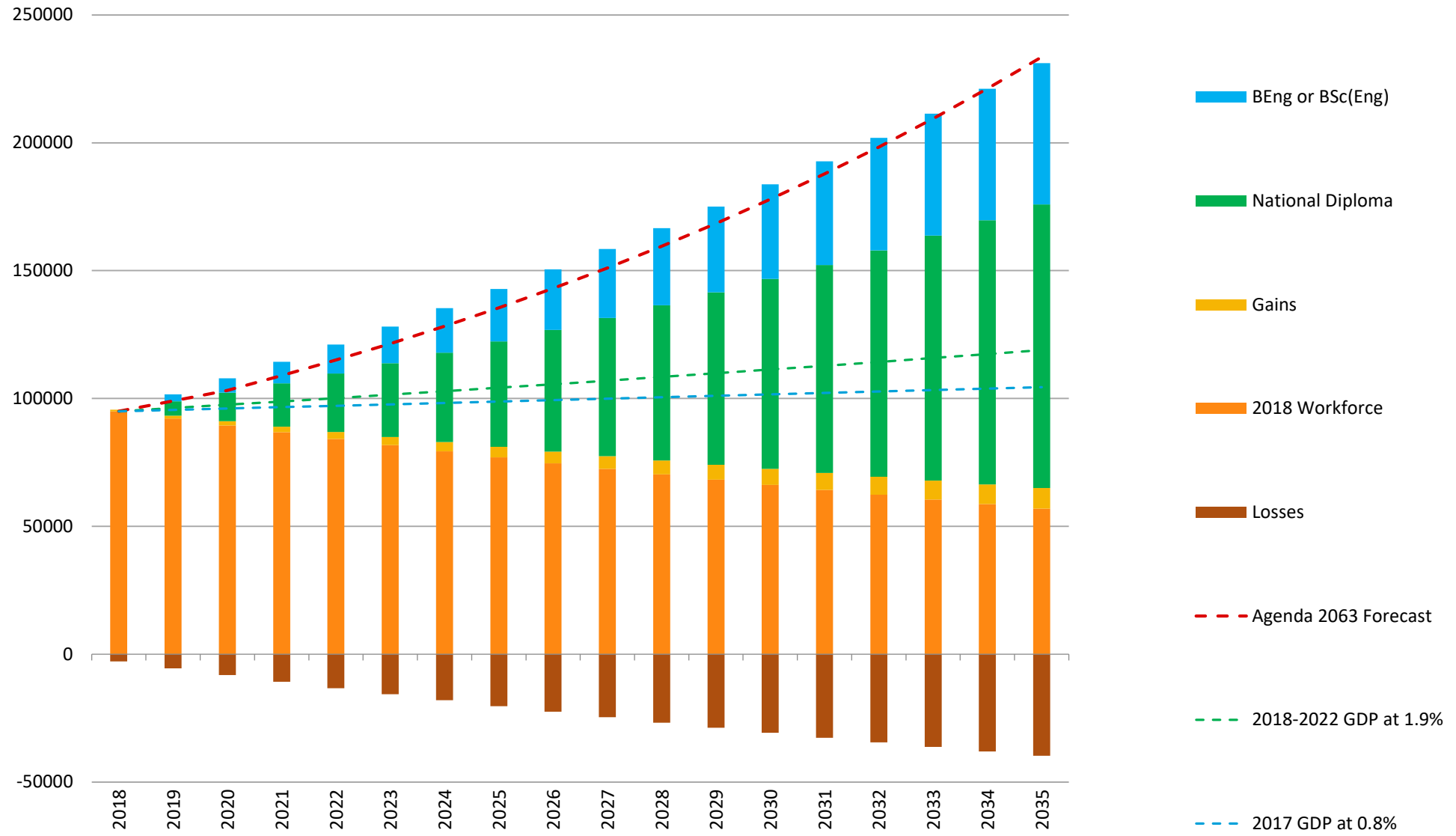
- Workforce – 510
- Graduate engineers – 10
- Graduate technicians – 40



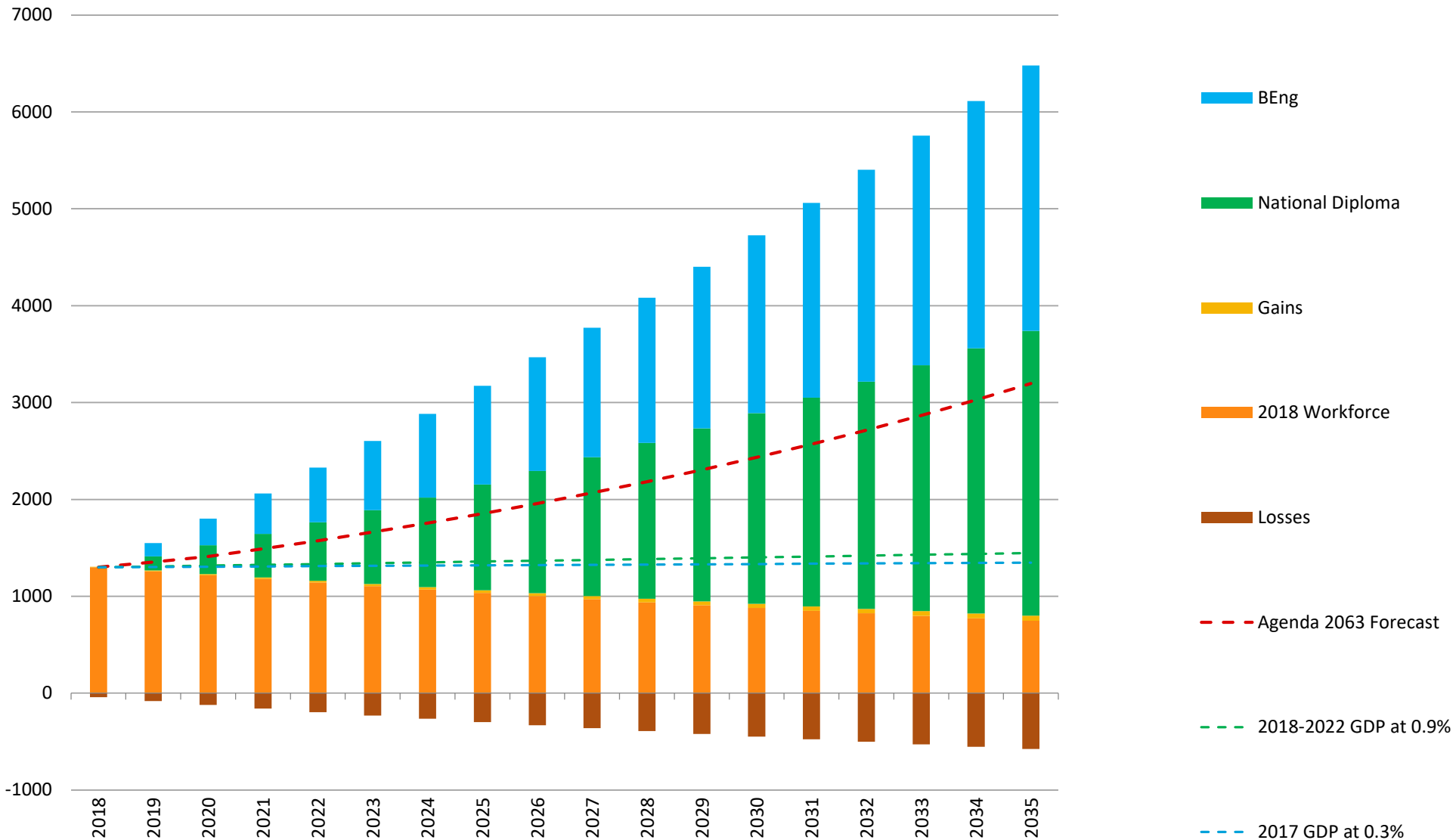


SOUTH AFRICA FLOW OF SKILLS

- Workforce – 95 000
- Graduate engineers – 2 800
- Graduate technicians – 5 625



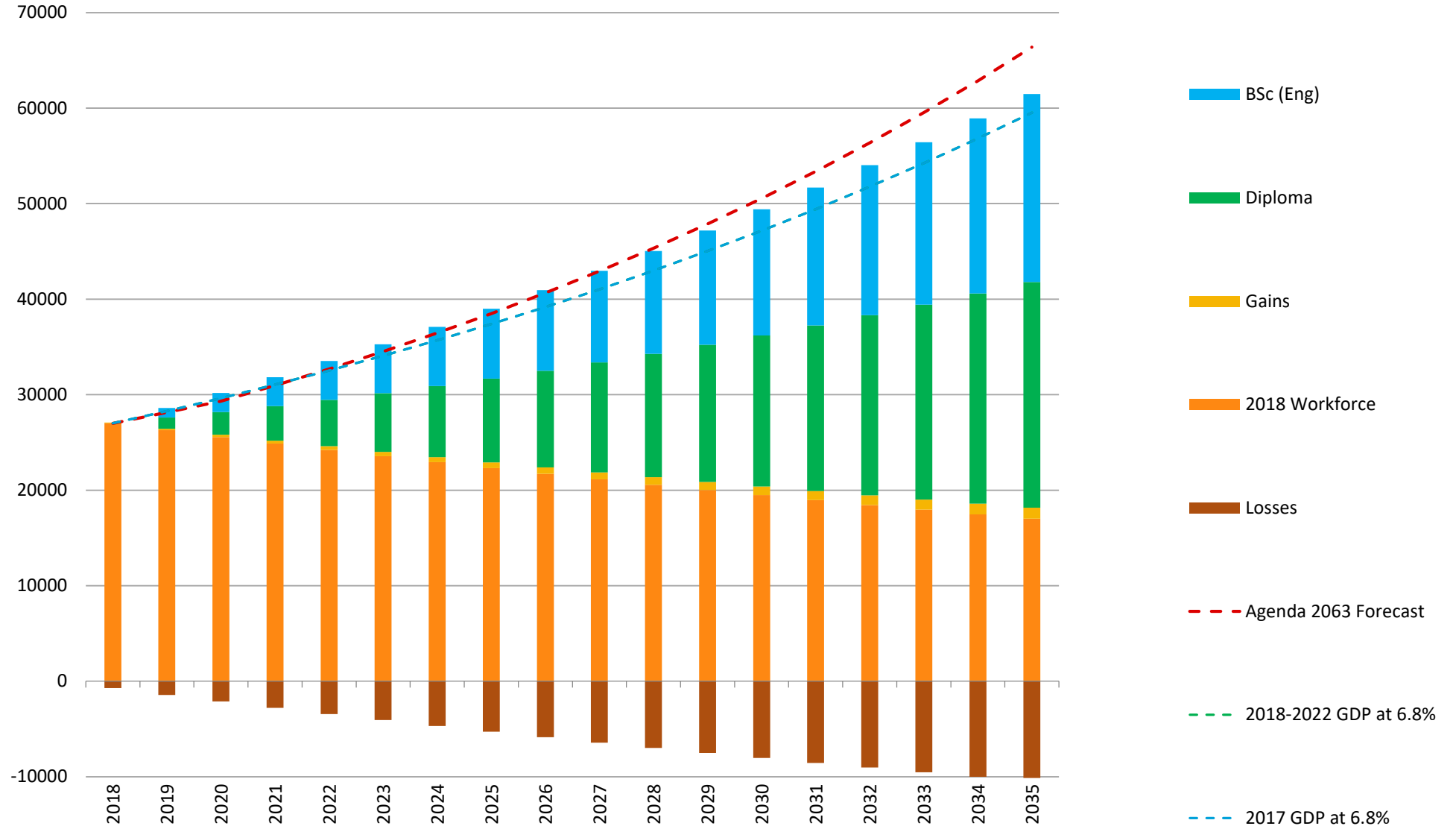
SWAZILAND FLOW OF SKILLS



- Workforce – 1 300
- Graduate engineers – 140
- Graduate technicians – 150



TANZANIA FLOW OF SKILLS

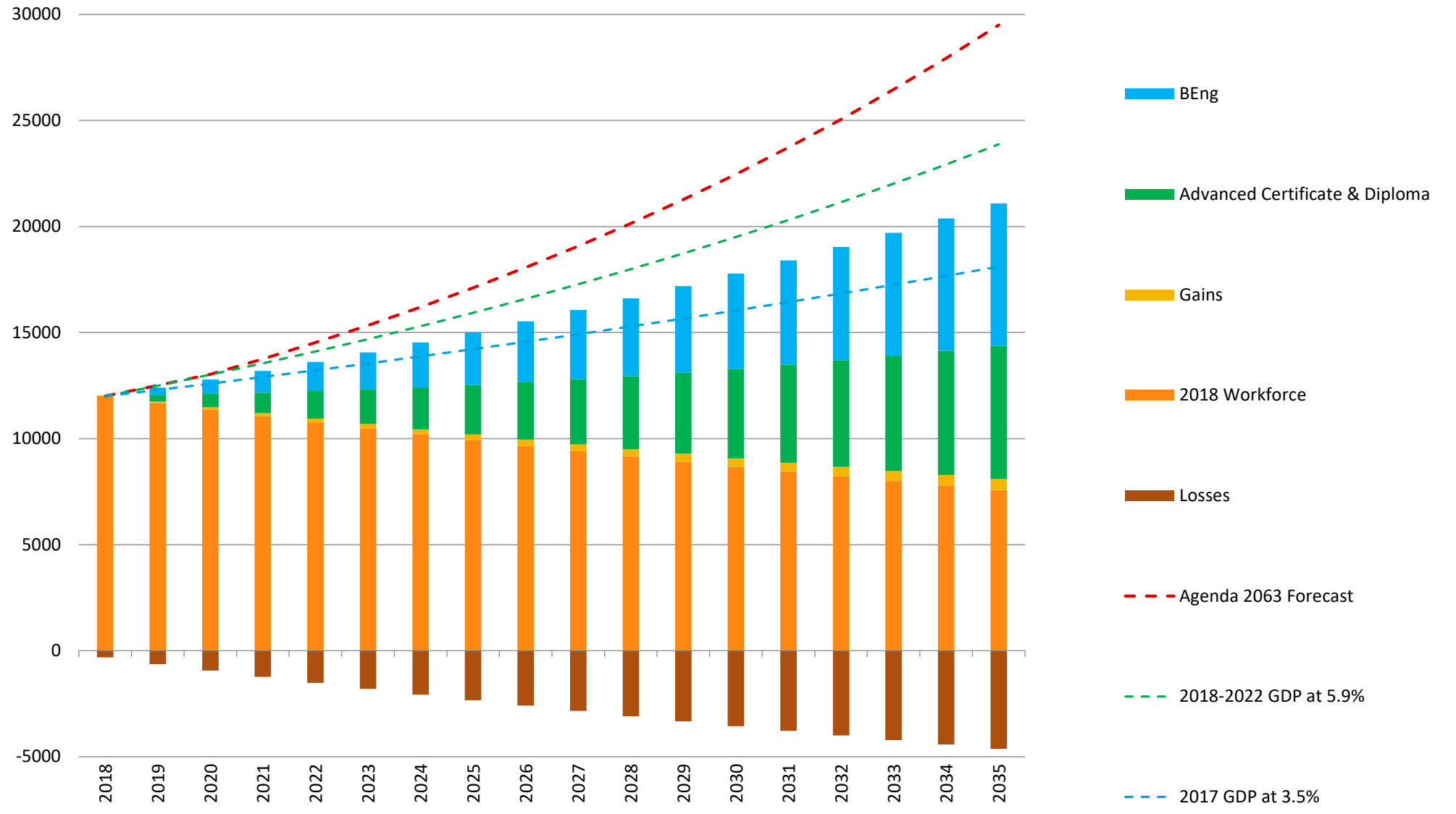


- Workforce – 27 000
- Graduate engineers – 1 000
- Graduate technicians – 1 200

ZAMBIA FLOW OF SKILLS



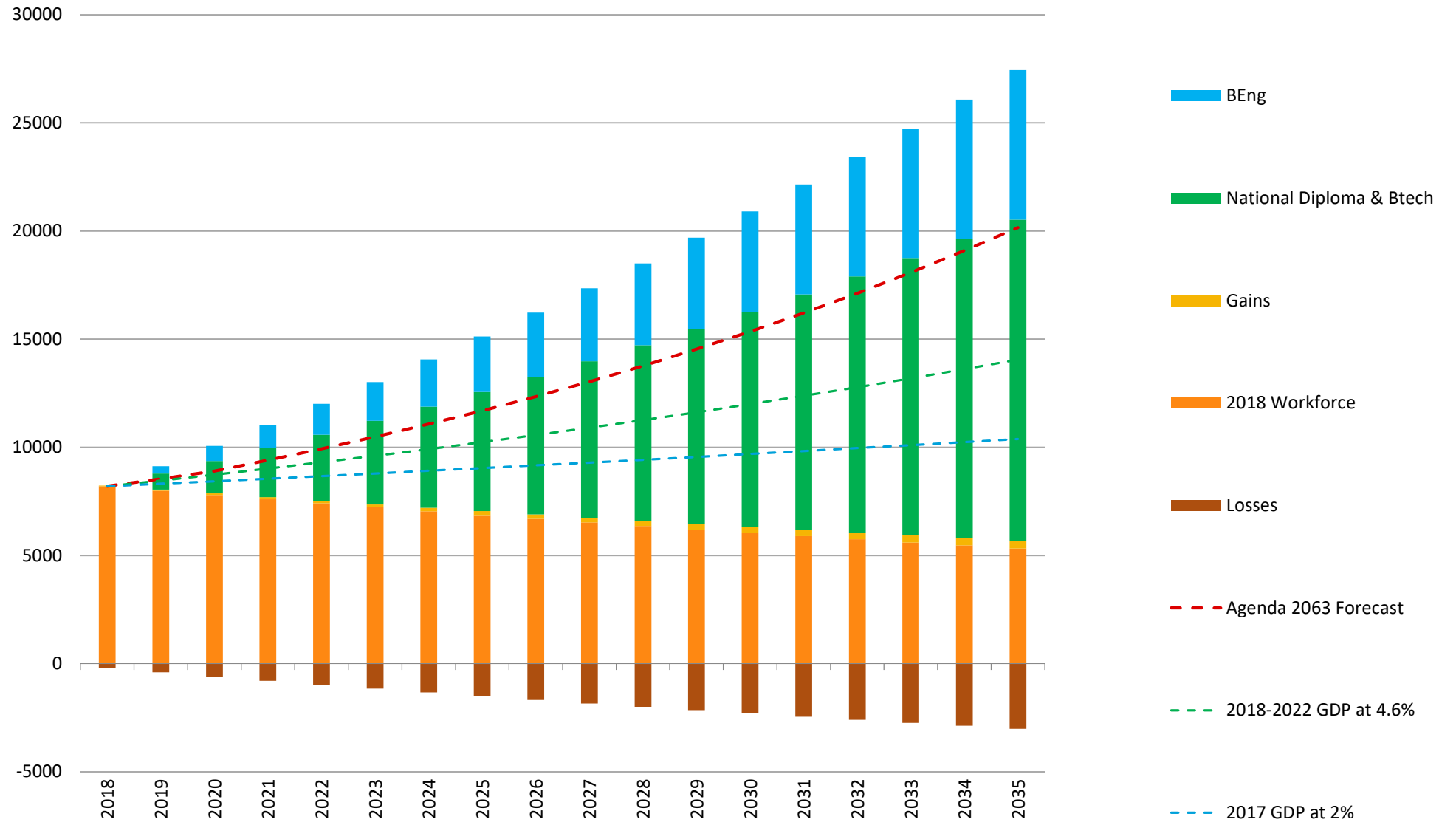
- Workforce – 12 000
- Graduate engineers – 341
- Graduate technicians – 320





ZIMBABWE FLOW OF SKILLS

- Workforce – 8 200
- Graduate engineers – 350
- Graduate technicians – 750



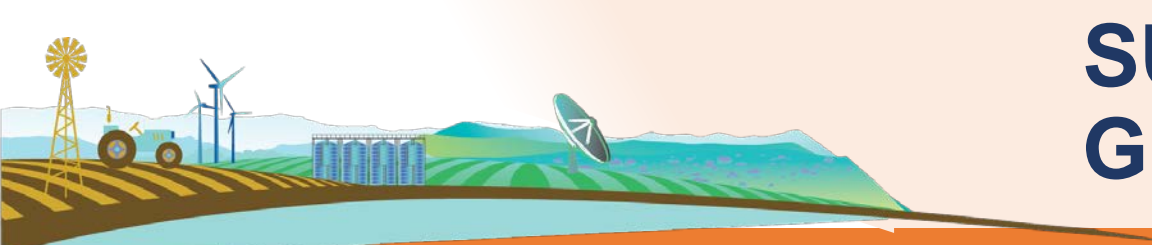


NUMBER AND PERCENTAGE OF GRADUATES TO ENGINEERING PRACTITIONERS

Country	Engineering Practitioners	Graduates	%
Angola	11000	950	9%
Botswana	5000	155	3%
DRC	18000	1400	8%
Lesotho	1100	347	32%
Madagascar	23000	1600	7%
Malawi	3000	250	8%
Mauritius	5000	380	8%
Mozambique	13000	1860	14%
Namibia	2800	190	7%
Seychelles	510	50	10%
South Africa	95000	8425	9%
Swaziland	1300	290	22%
Tanzania	27000	2200	8%
Zambia	12000	661	6%
Zimbabwe	8200	1100	13%

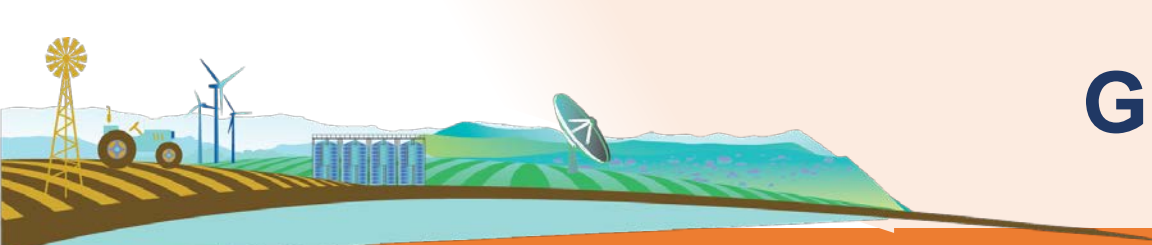
PERCENTAGE PER AGE GROUP

Country	Percentage per age group			
	0-24	25-34	35-64	>=65
Angola	63.55%	14.04%	19.54%	2.88%
Botswana	45.90%	16.67%	32.08%	5.34%
DRC	62.96%	13.97%	19.83%	3.24%
Lesotho	53.74%	17.11%	24.88%	4.27%
Madagascar	57.86%	15.10%	23.39%	3.65%
Malawi	60.66%	15.38%	20.92%	3.04%
Mauritius	30.30%	14.22%	40.69%	14.79%
Mozambique	61.78%	14.58%	20.34%	3.30%
Namibia	53.38%	16.09%	26.19%	4.34%
Seychelles	34.50%	13.43%	39.32%	12.75%
South Africa	44.16%	16.48%	32.75%	6.61%
Swaziland	54.60%	17.09%	24.81%	3.50%
Tanzania	61.68%	14.36%	20.58%	3.38%
Zambia	62.21%	14.82%	20.24%	2.72%
Zimbabwe	57.03%	16.34%	23.47%	3.17%
World	39.87%	14.59%	34.71%	10.83%
Africa	57.37%	14.91%	23.66%	4.06%
Asia	37.29%	14.89%	37.04%	10.78%
Europe	26.35%	12.23%	40.31%	21.11%
Northern America	30.91%	13.19%	37.43%	18.47%
South America	36.67%	15.12%	36.78%	11.43%

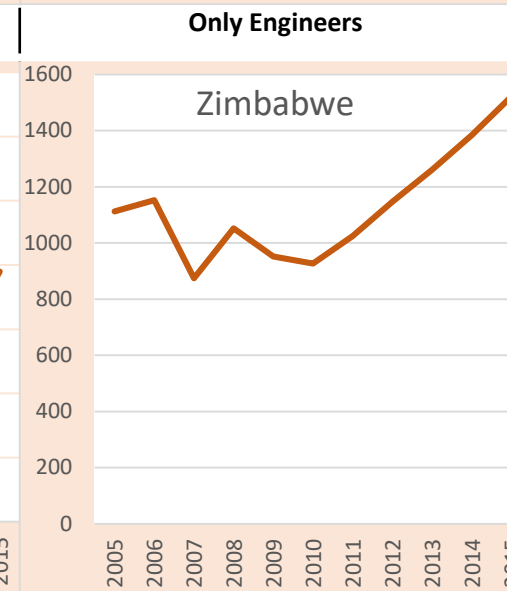
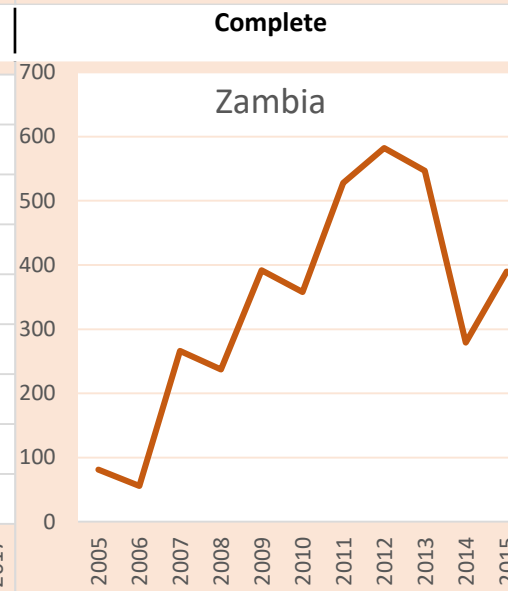
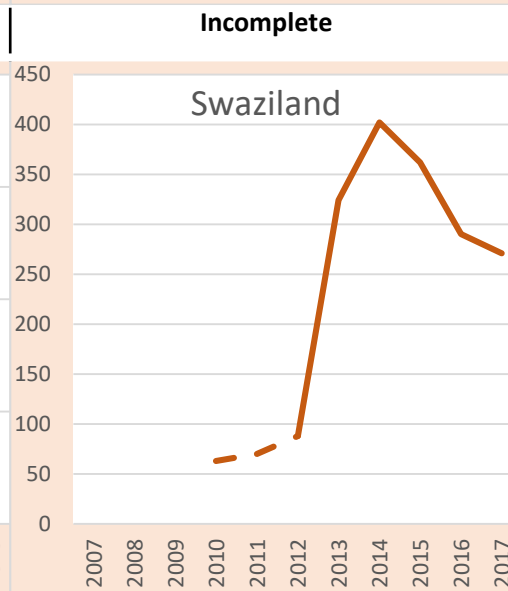
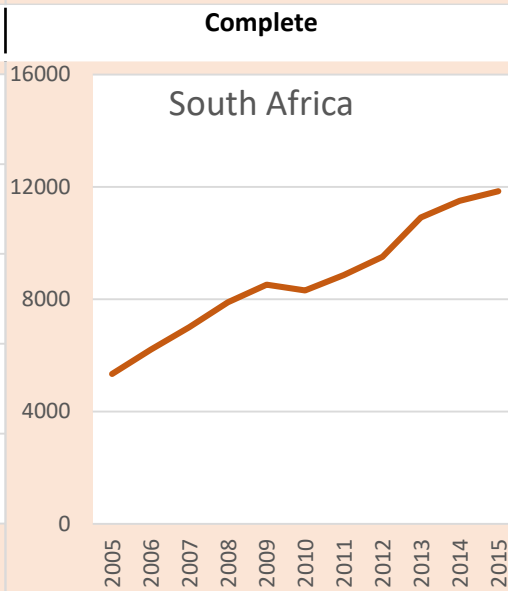
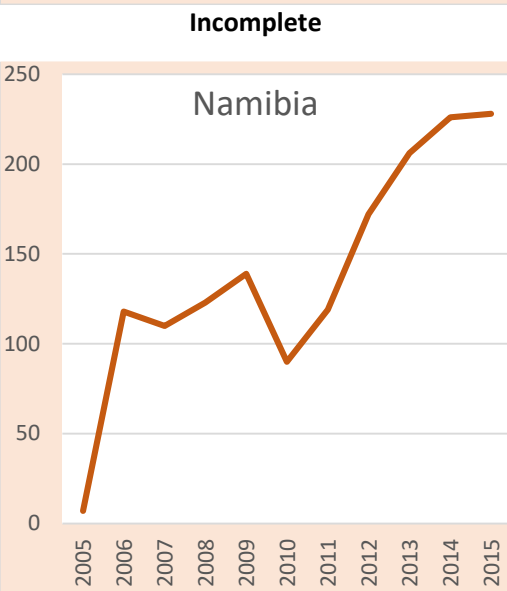
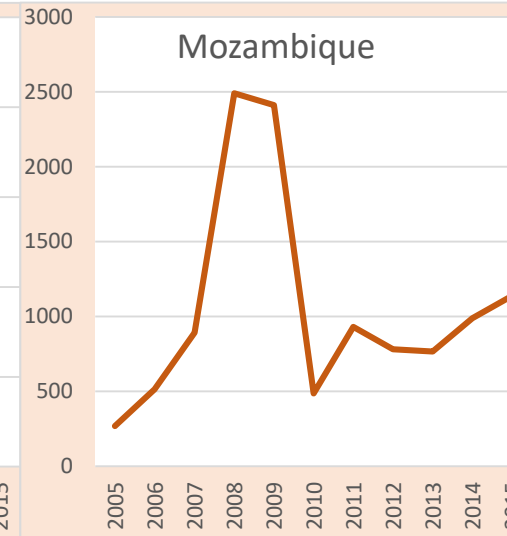
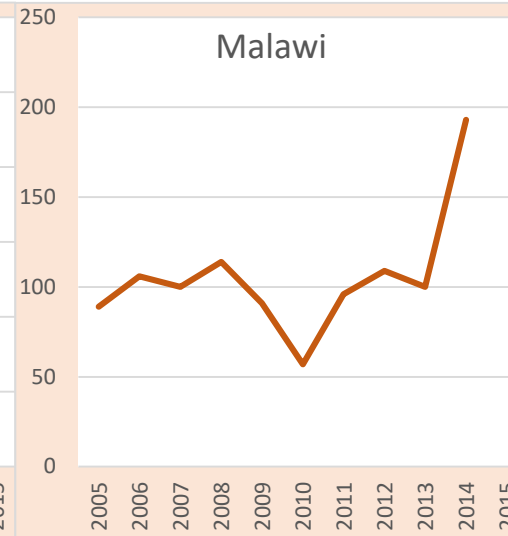
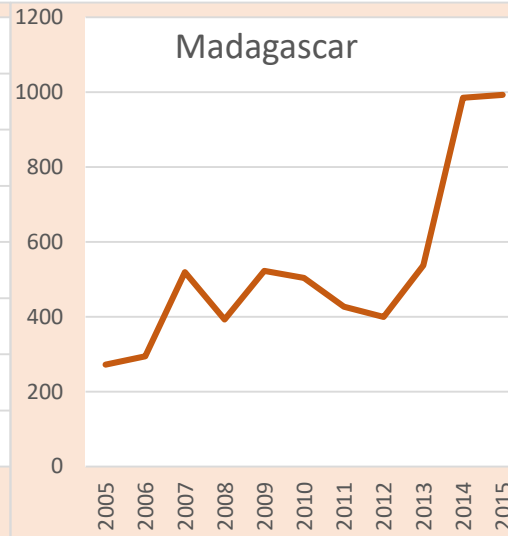
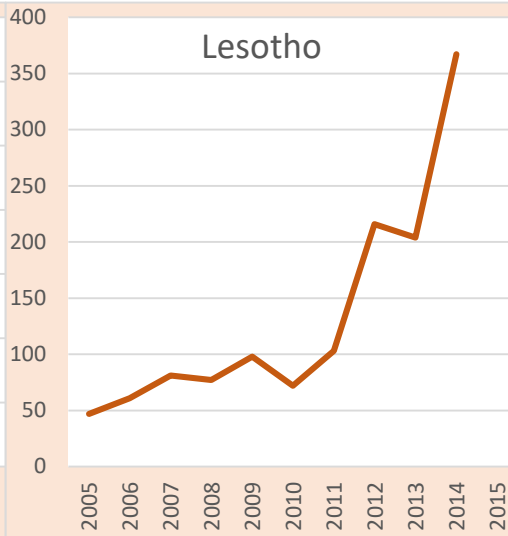
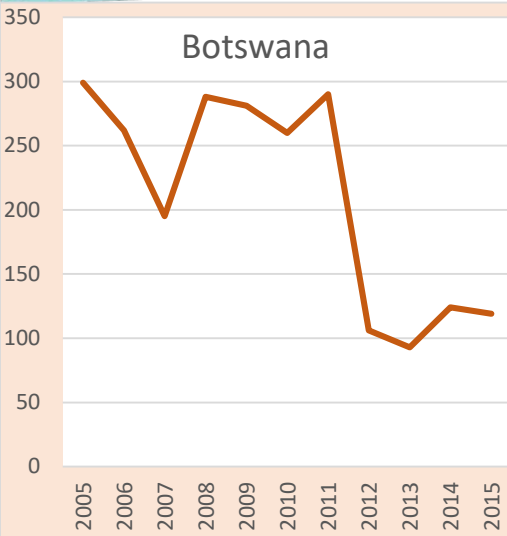


SUMMARY OF ECONOMIC GROWTH IN SADC 2010 TO 2022

Top Growth (2016)		Top Growth (2010-2015)		Top Projected (2017-2022)	
Tanzania	↑ 6.6%	DRC	↑ 7.7%	Mozambique	↑ 7.3%
Seychelles	→ 4.4%	Zimbabwe	↑ 7.2%	Tanzania	↑ 6.7%
Madagascar	→ 4.1%	Mozambique	↑ 7.0%	Malawi	↑ 5.3%
Mauritius	→ 3.6%	Tanzania	↑ 6.8%	Madagascar	→ 4.9%
Mozambique	→ 3.4%	Zambia	↑ 6.0%	Zambia	→ 4.2%
Zambia	→ 3.0%	Namibia	↑ 5.6%	Botswana	→ 4.2%
Lesotho	→ 2.9%	Botswana	↑ 5.5%	Mauritius	→ 4.1%
Botswana	→ 2.9%	Seychelles	↑ 5.3%	Namibia	→ 4.0%
DRC	→ 2.4%	Malawi	→ 4.6%	DRC	→ 3.9%
Malawi	→ 2.3%	Angola	→ 4.5%	Seychelles	→ 3.5%
Zimbabwe	↓ 0.5%	Lesotho	→ 4.4%	Lesotho	→ 3.3%
South Africa	↓ 0.3%	Mauritius	→ 3.6%	South Africa	↓ 1.9%
Namibia	↓ 0.1%	Swaziland	→ 3.1%	Angola	↓ 1.4%
Angola	↓ 0.0%	South Africa	→ 2.3%	Swaziland	↓ 0.5%
Swaziland	↓ -0.4%	Madagascar	↓ 2.2%	Zimbabwe	↓ 0.5%



GRADUATION TRENDS 2005-2015



Incomplete

Complete

Incomplete

Complete

Only Engineers

Complete

Complete

Complete

Incomplete

Incomplete