
State of the Gasification Industry: Worldwide Gasification and Syngas Databases 2016 Update

**Gasification & Syngas Technologies Conference
Vancouver, 19th October, 2016**

Chris Higman

higman consulting gmbh

GSTC, 2016

Overview

- **Introduction**
- **Updated evaluations**
- **Biomass data**
- **New SMR database**
- **Conclusions**

Introduction

- **First edition 1999**
- **Updated regularly since then**
- **2015 Update**
 - Total 959 projects, 2559 gasifiers, of which:
 - Active commercial operating and planned 340 projects, 833 gasifiers
 - 148 GW_{th} operating, 97 GW_{th} under construction and 113 GW_{th} planned.

What's New in 2016 Database - Content

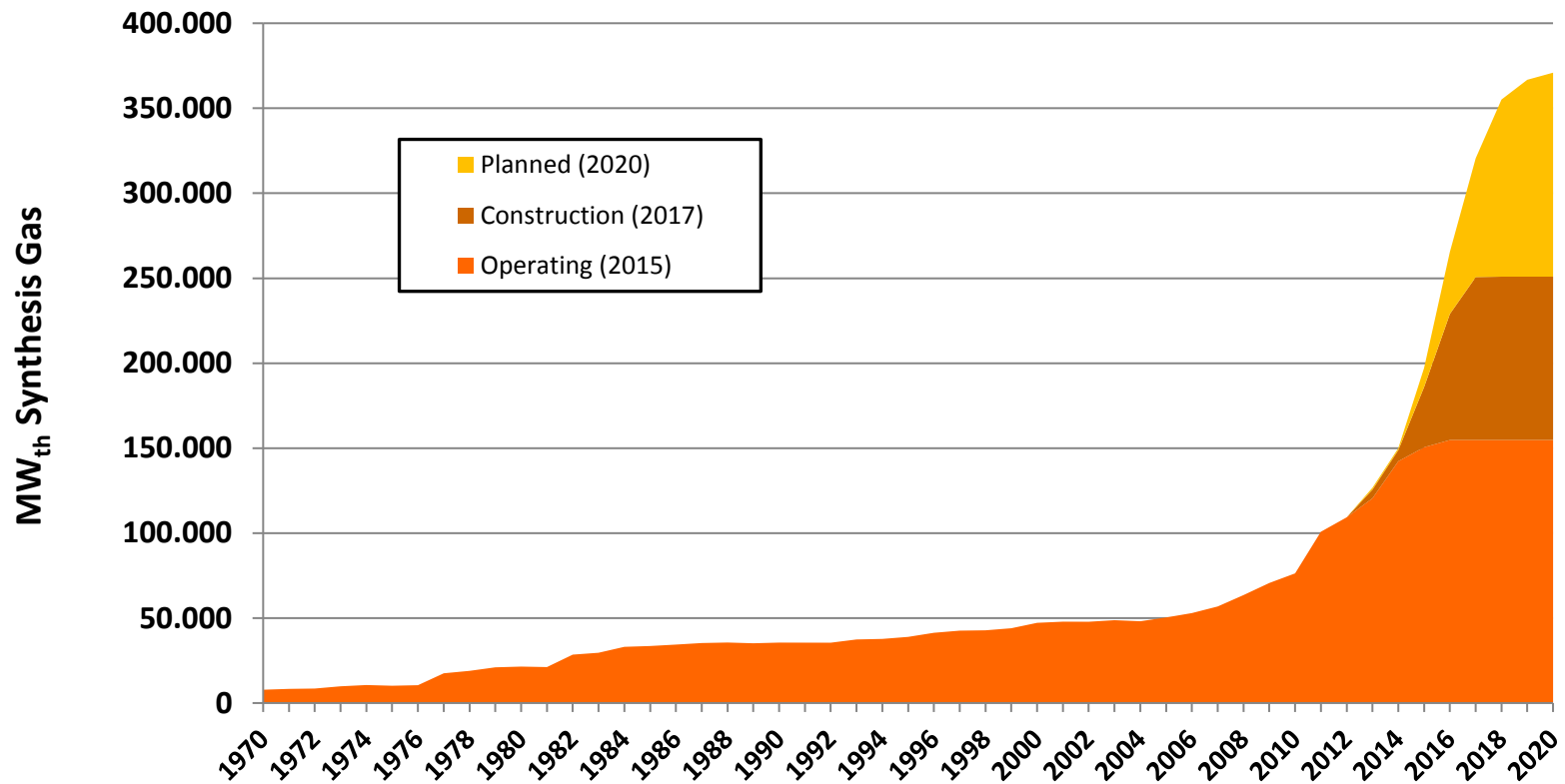
- **Content**

- Total 1014 projects, 2559 gasifiers not counting spares, of which:

Commercial	Projects	Gasifiers	GWth Syngas
Operating	356	863	154
Construction	108	322	96
Planned	134	685	250
Total	598	1,870	370

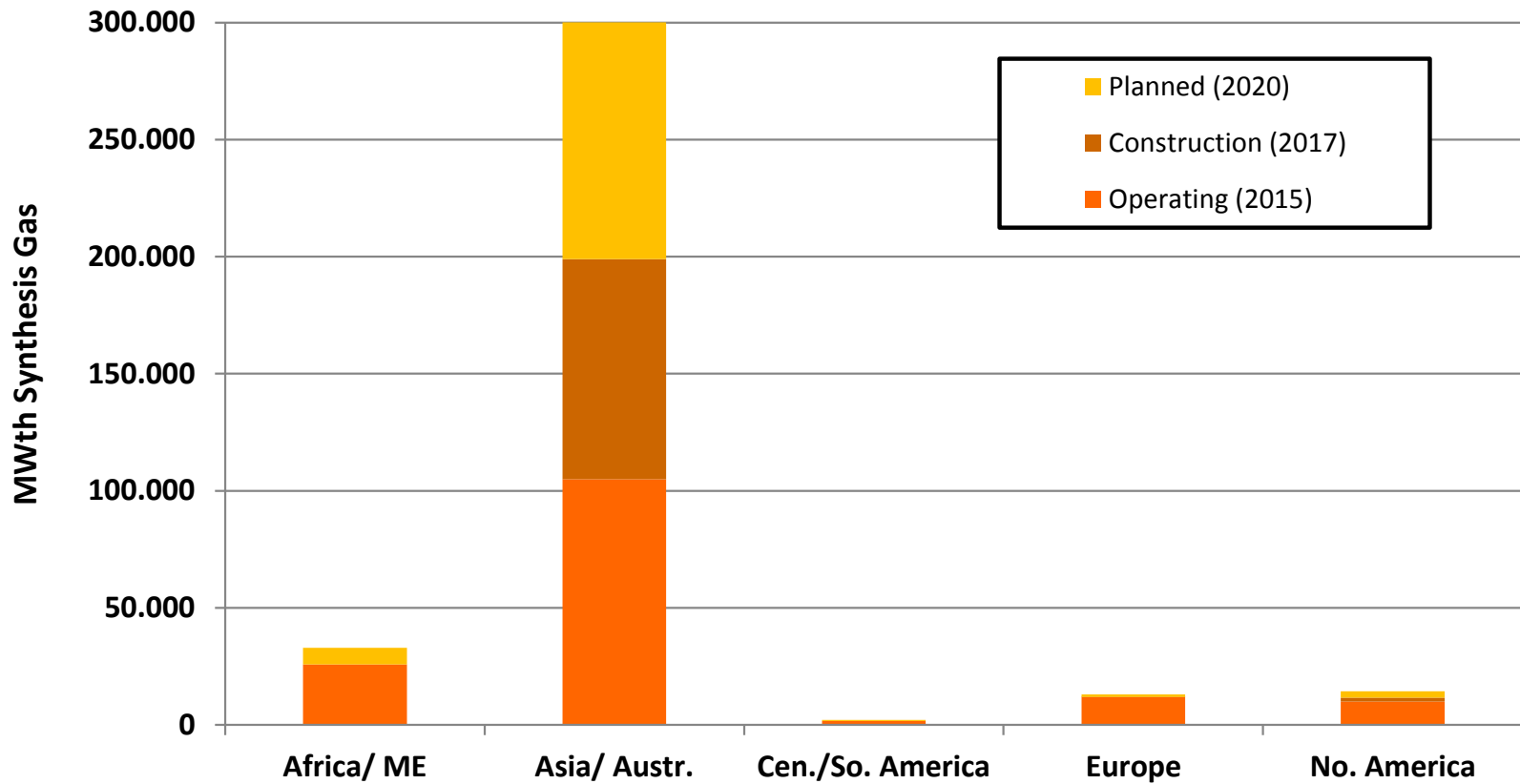
Note: Total database includes shutdown gasifiers, gasifiers never built or only in pre-planning stage, as well as pilot and demonstration gasifiers.

Cumulative Capacity with Probable Increase



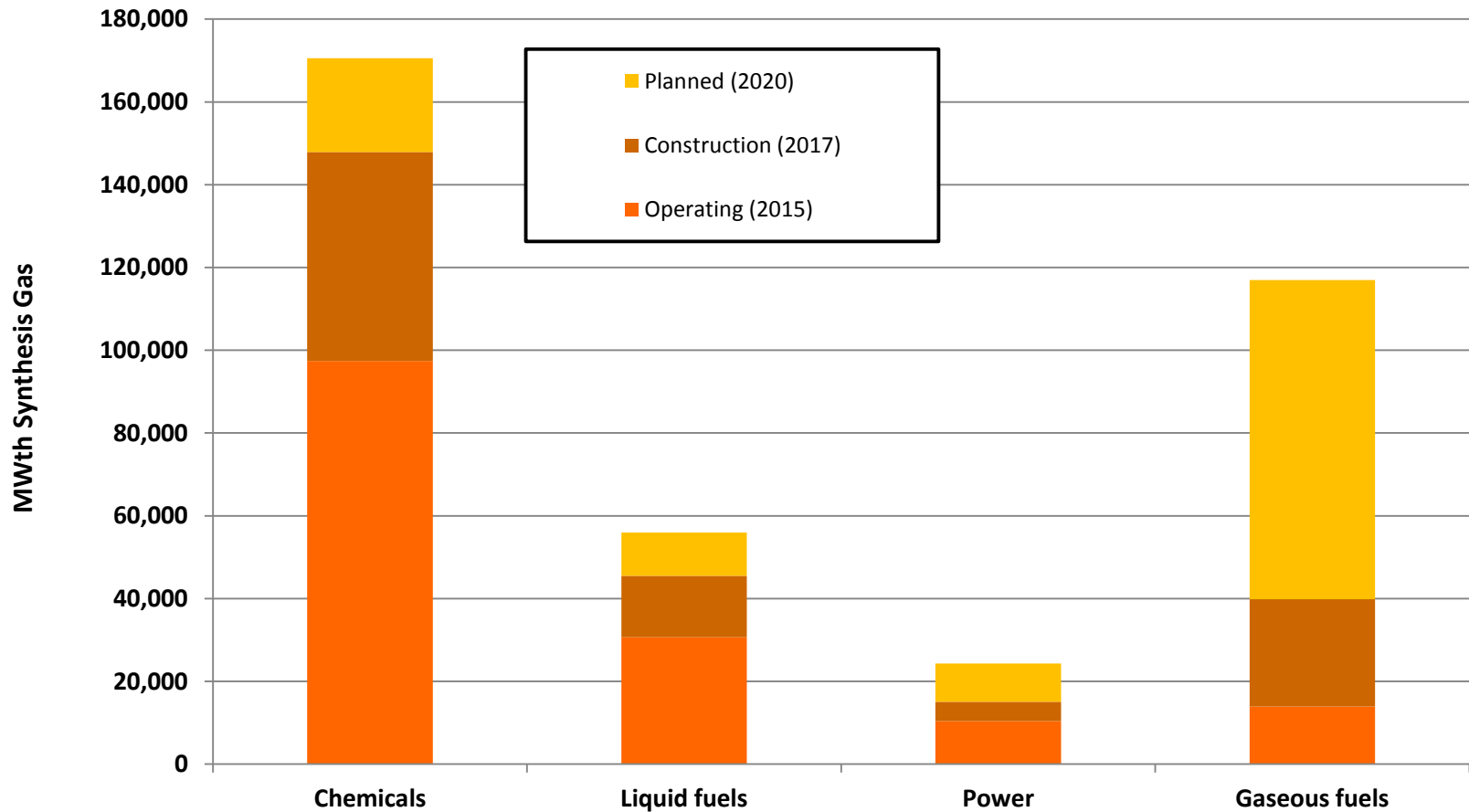
Source: GSTC Database, 2016

Gasification by Region



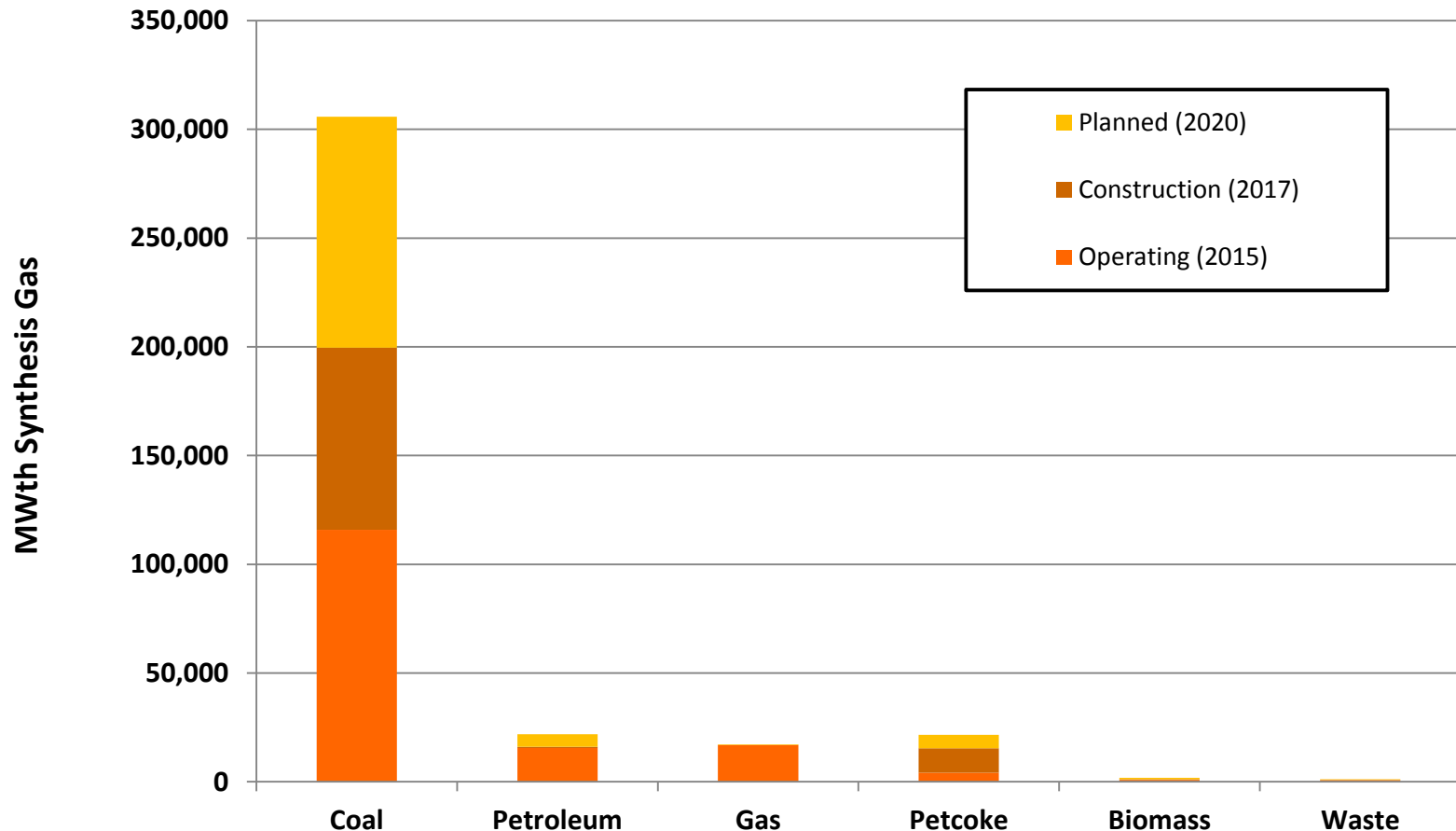
Source: GSTC Database, 2016

End Use Applications of Syngas



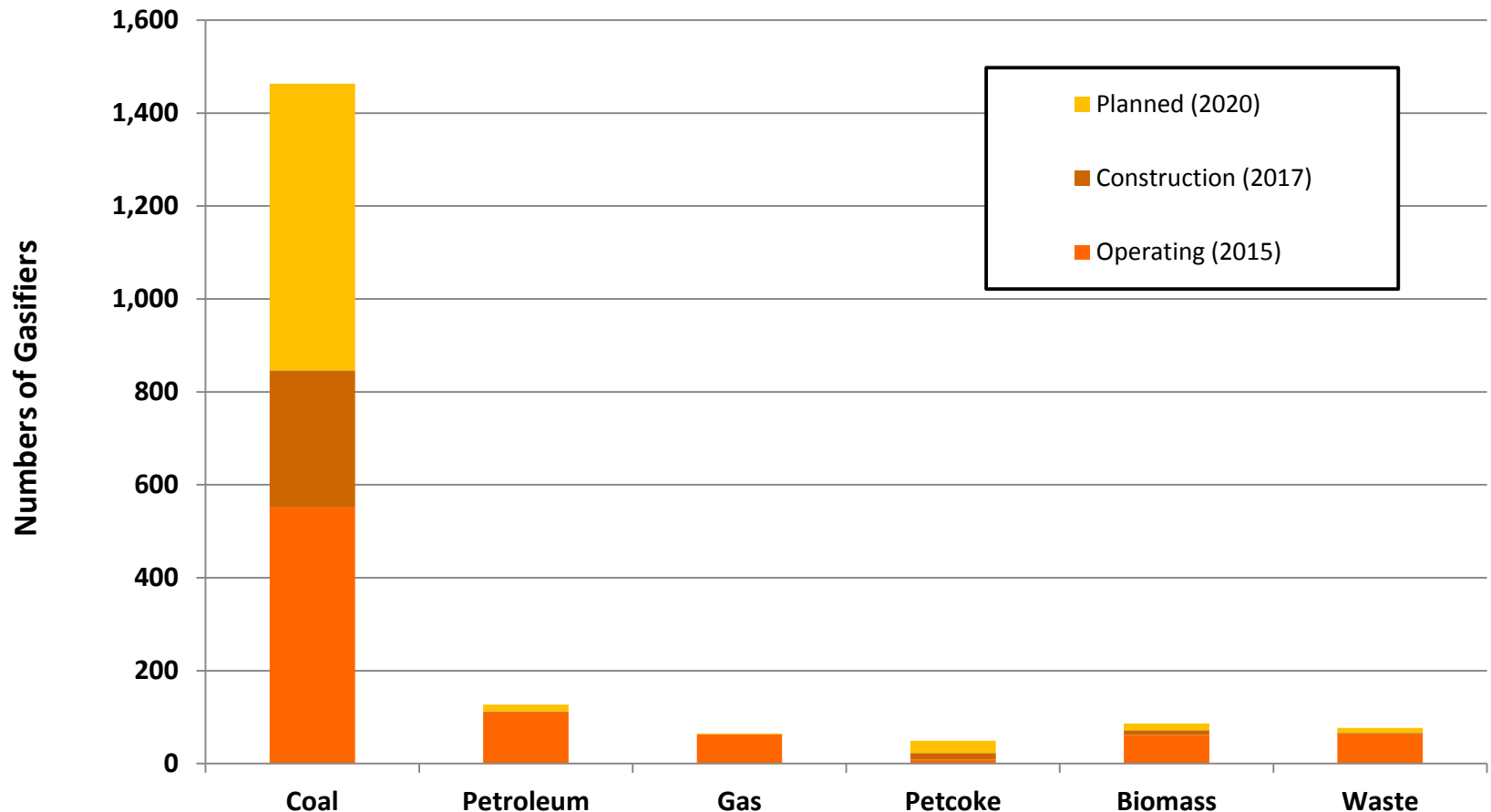
Source: GSTC Database, 2016

Primary Feedstocks for Gasification



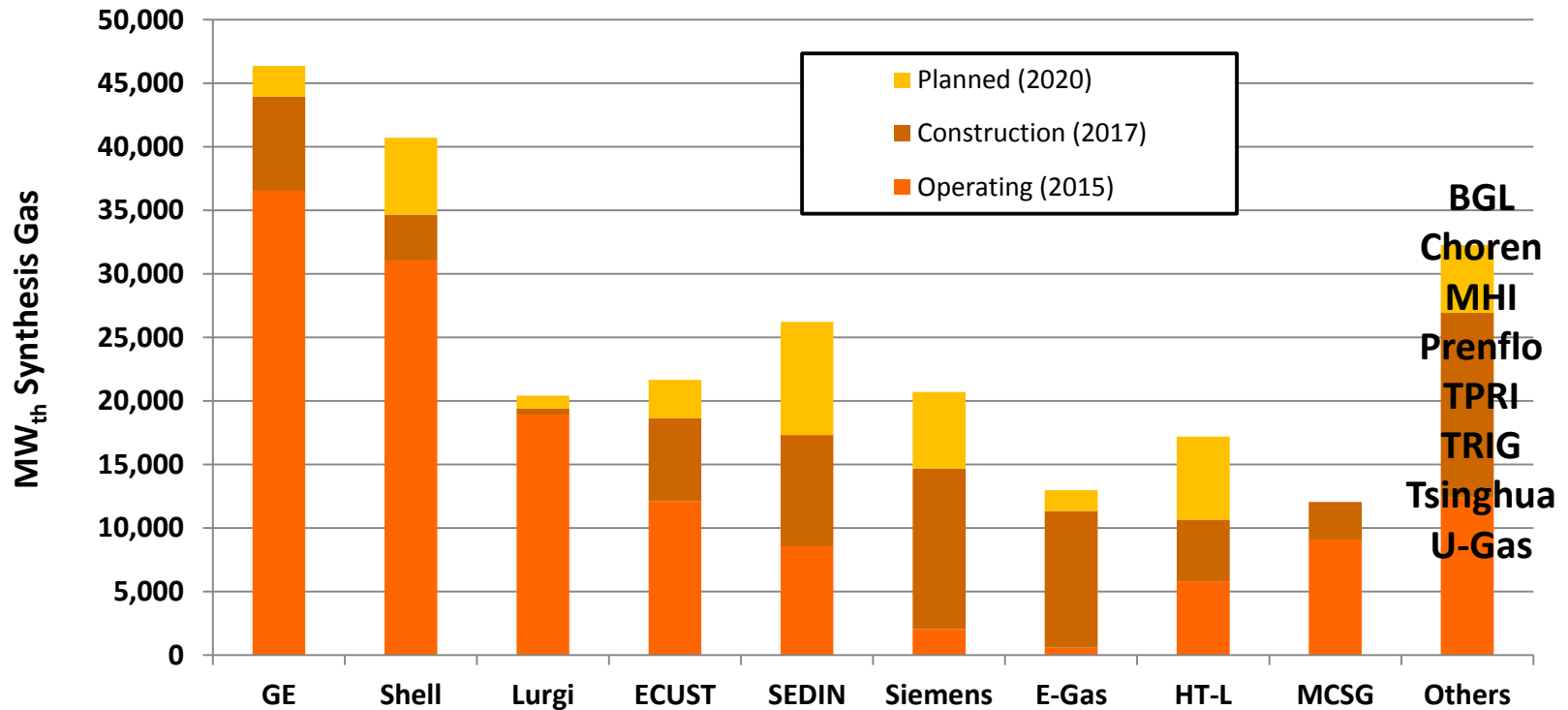
Source: GSTC Database, 2016

Number of Gasifiers by Primary Feedstocks



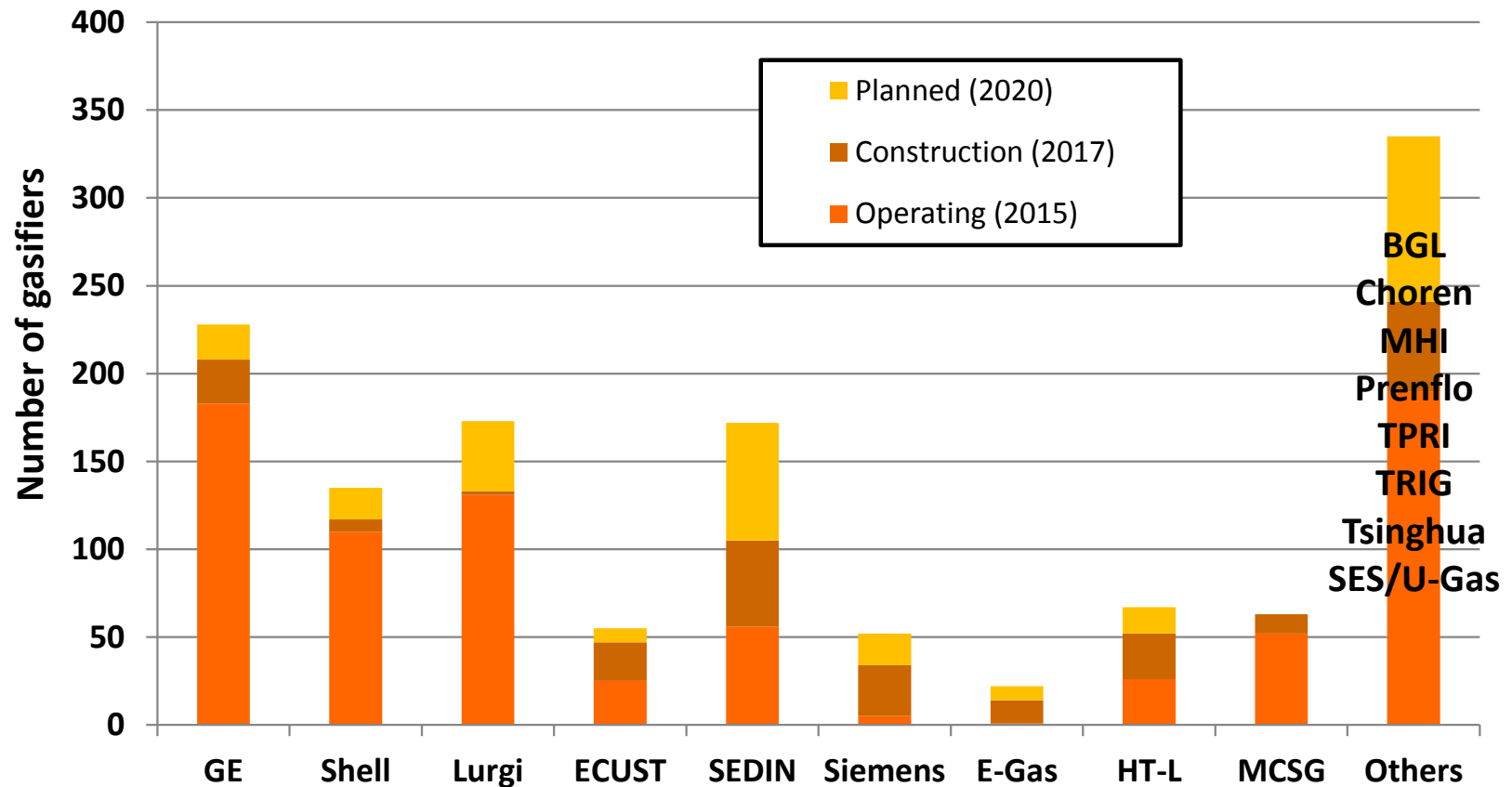
Source: GSTC Database, 2016

Gasification by Technology



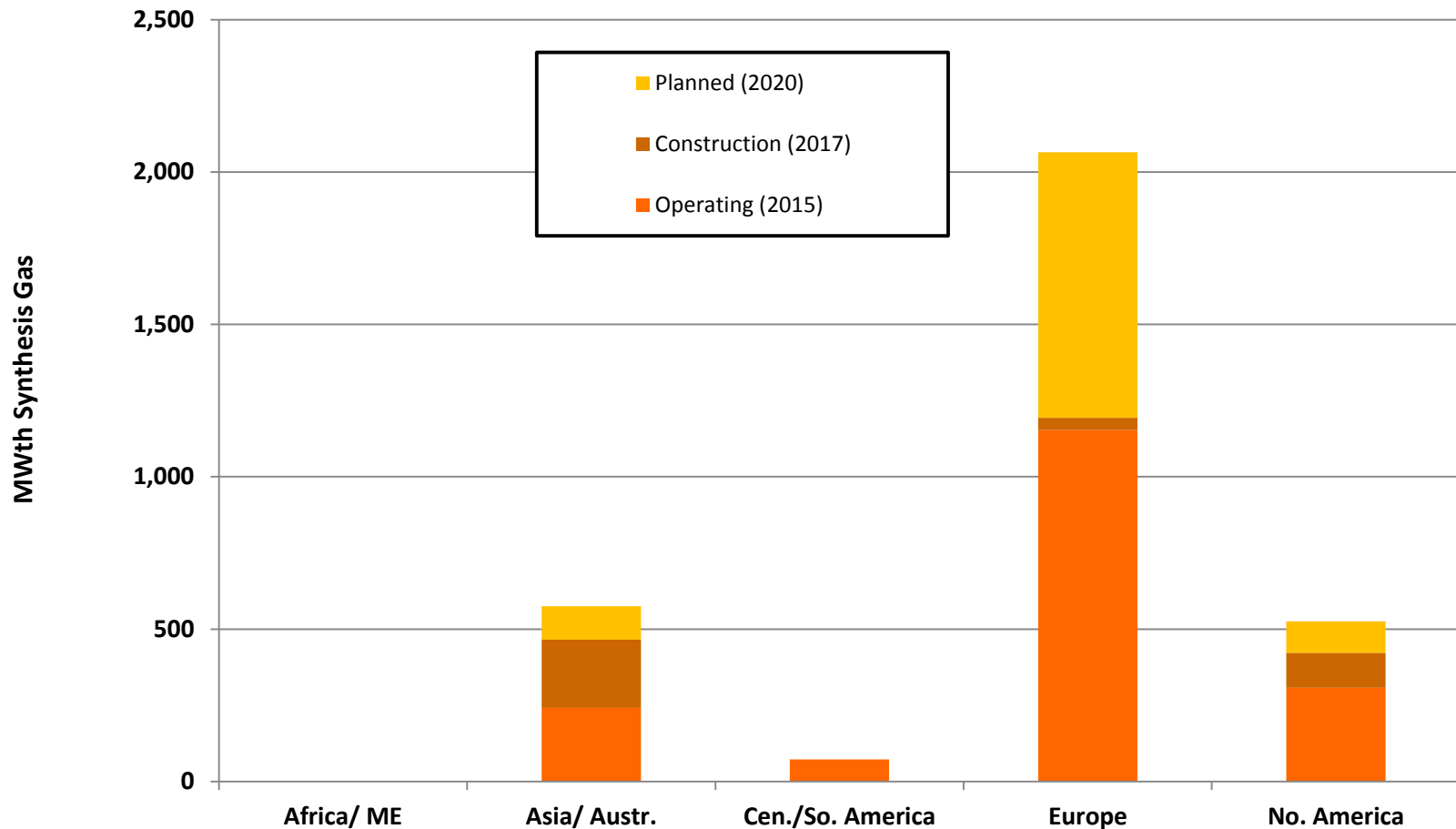
Source: GSTC Database, 2016

Numbers of Gasifiers by Technology



Source: GTC Database, 2016

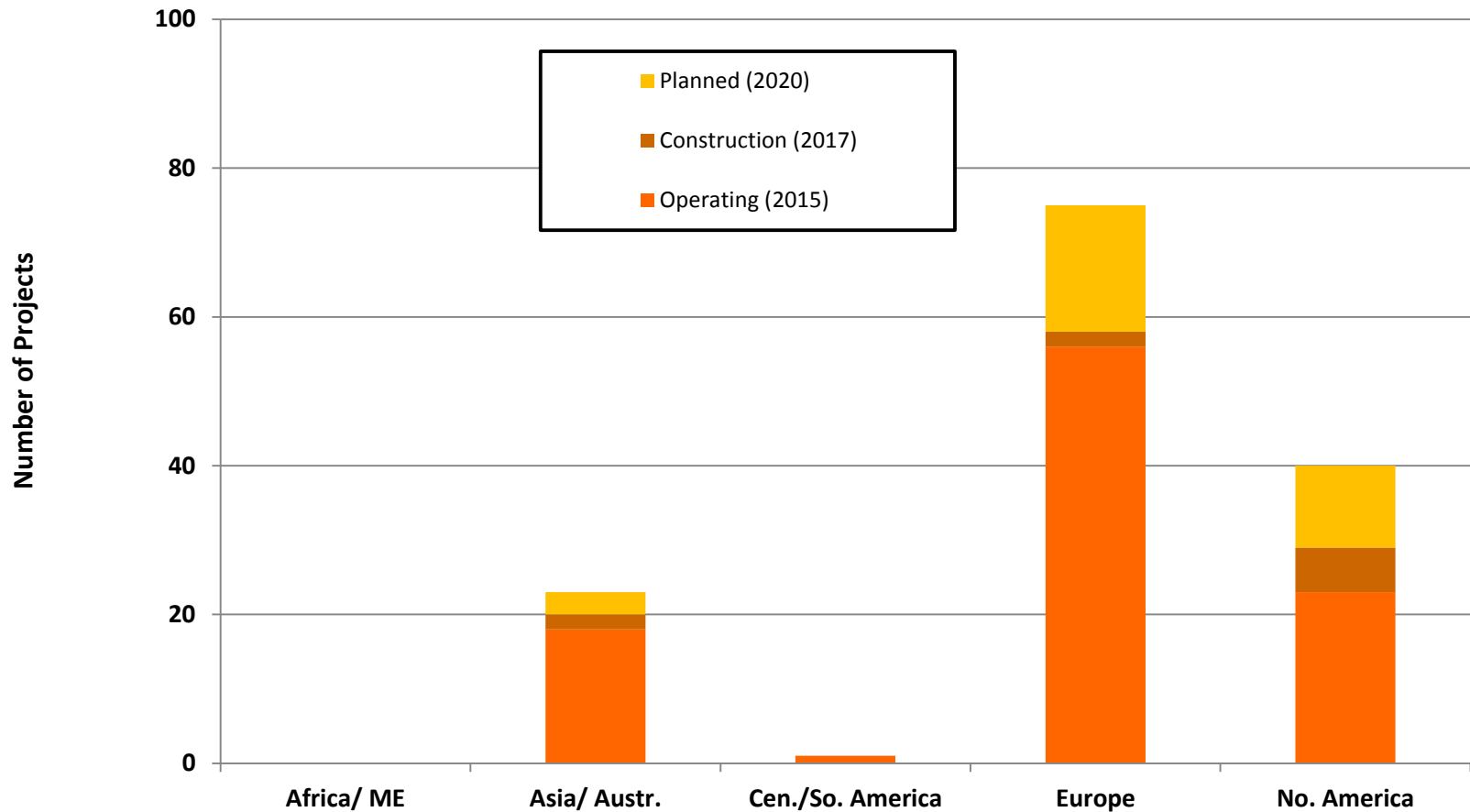
Biomass Gasification



*Planned/under construction (8)

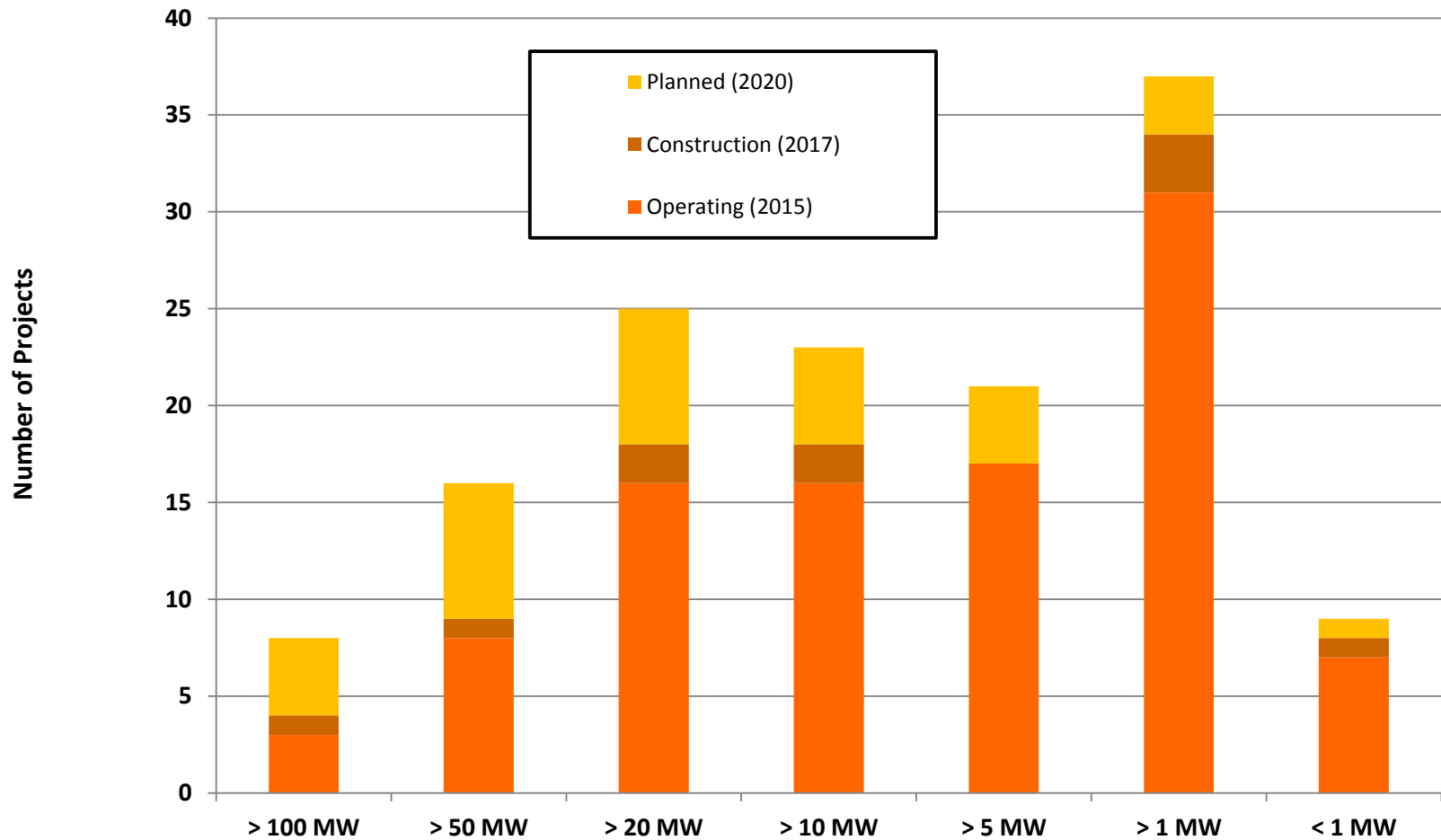
Source: GSTC Database, 2016

Numbers of Biomass Gasifiers



Source: GSTC Database, 2016

Biomass Gasifiers by Size



Source: GSTC Database, 2016

New Syngas Database for SMR and ATR Technologies

- **Methodology basically same as for Gasification Database**
 - But some classifications need to be harmonized
- **All data is public domain**
- **Data coverage**
 - Ammonia, methanol, DRI, FT liquids > 95% of plants
 - Refining hydrogen > 85% of plants
 - With these five applications coverage is about 85% of total market by volume
- **Other applications**
 - Other hydrogen (off-site) and chemicals estimated from 2011 data by others¹
 - No attempt to cover small plants (<5,000 Nm³/h)

¹ H. Tautz, „Opportunities of dry reforming for syngas production processes.”
8th International Freiberg Conference, Cologne 12-16. June 2016

Reformer Syngas Database - Content

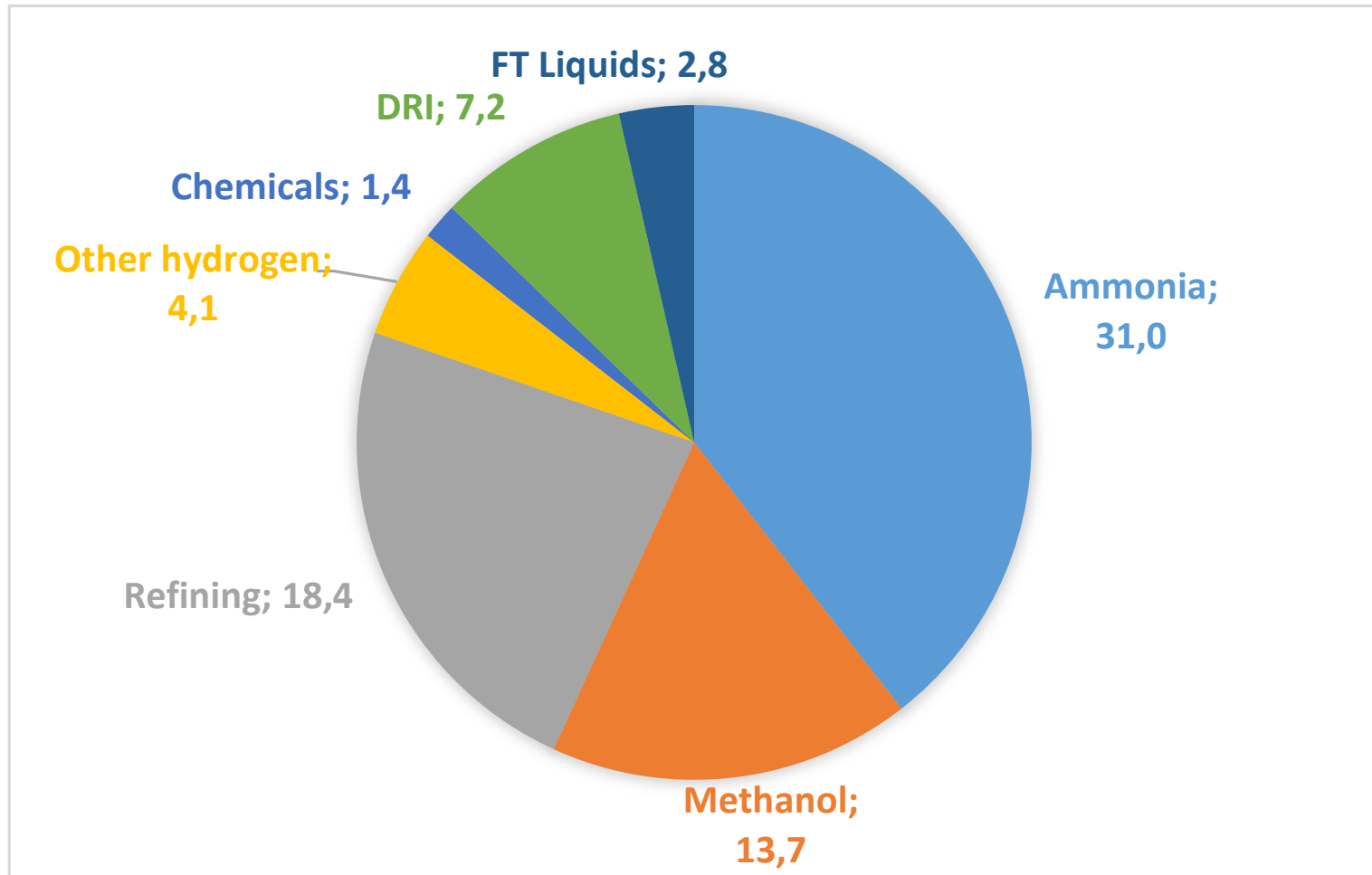
- **981 Projects**

Commercial	Projects	Units	GWth Syngas
Operating	774	878	227
Construction	34	35	19
Planned	27	31	9
Total Active-Real and Planned	835	944	256

Note: Total database includes shutdown reformers, reformers never built or only in pre-planning stage, as well as pilot and demonstration reformers.

Source: GSTC Database, 2016

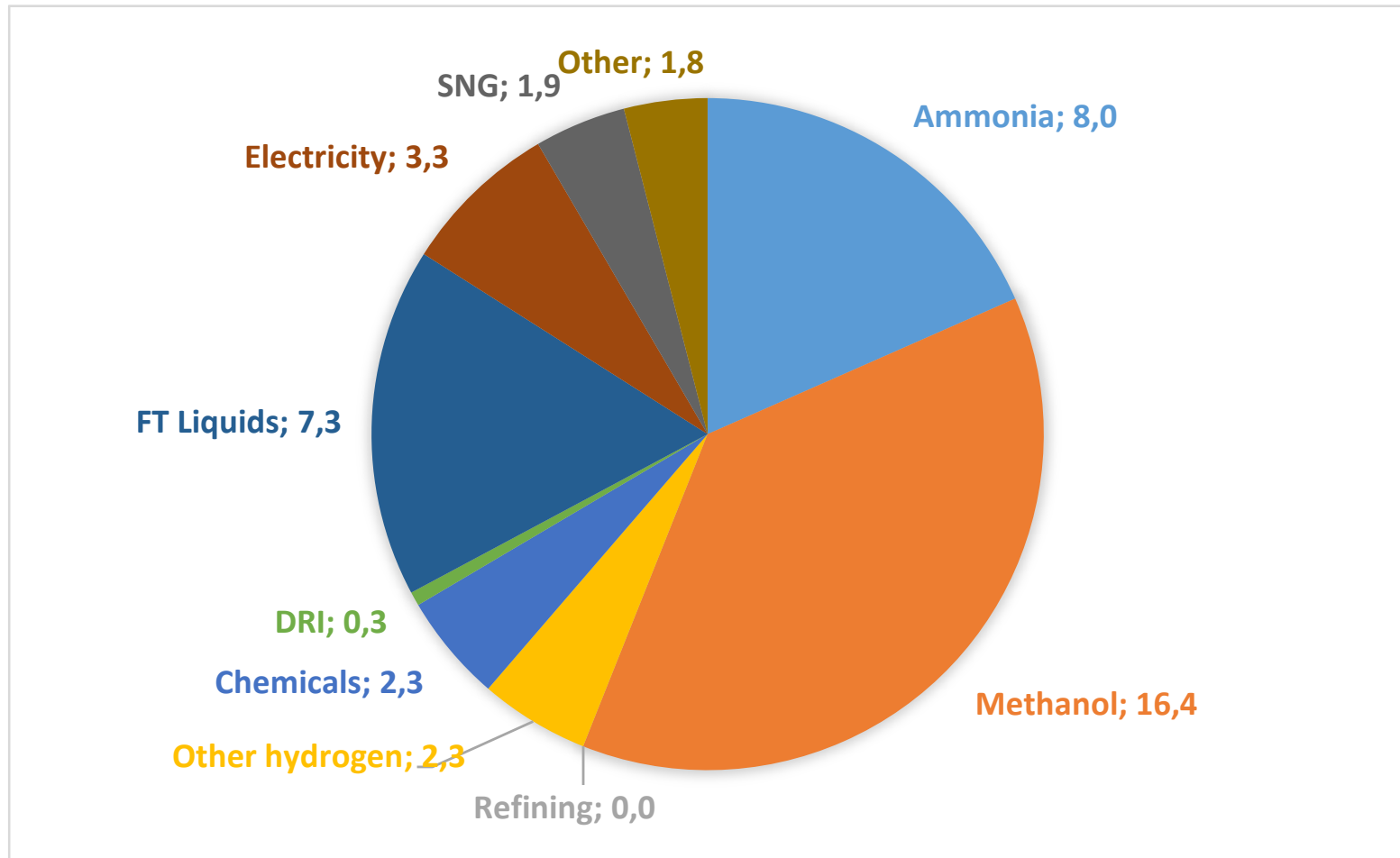
Syngas from SMR and ATR Technologies



Data in MM Nm³/h

Source: GSTC Database, 2016

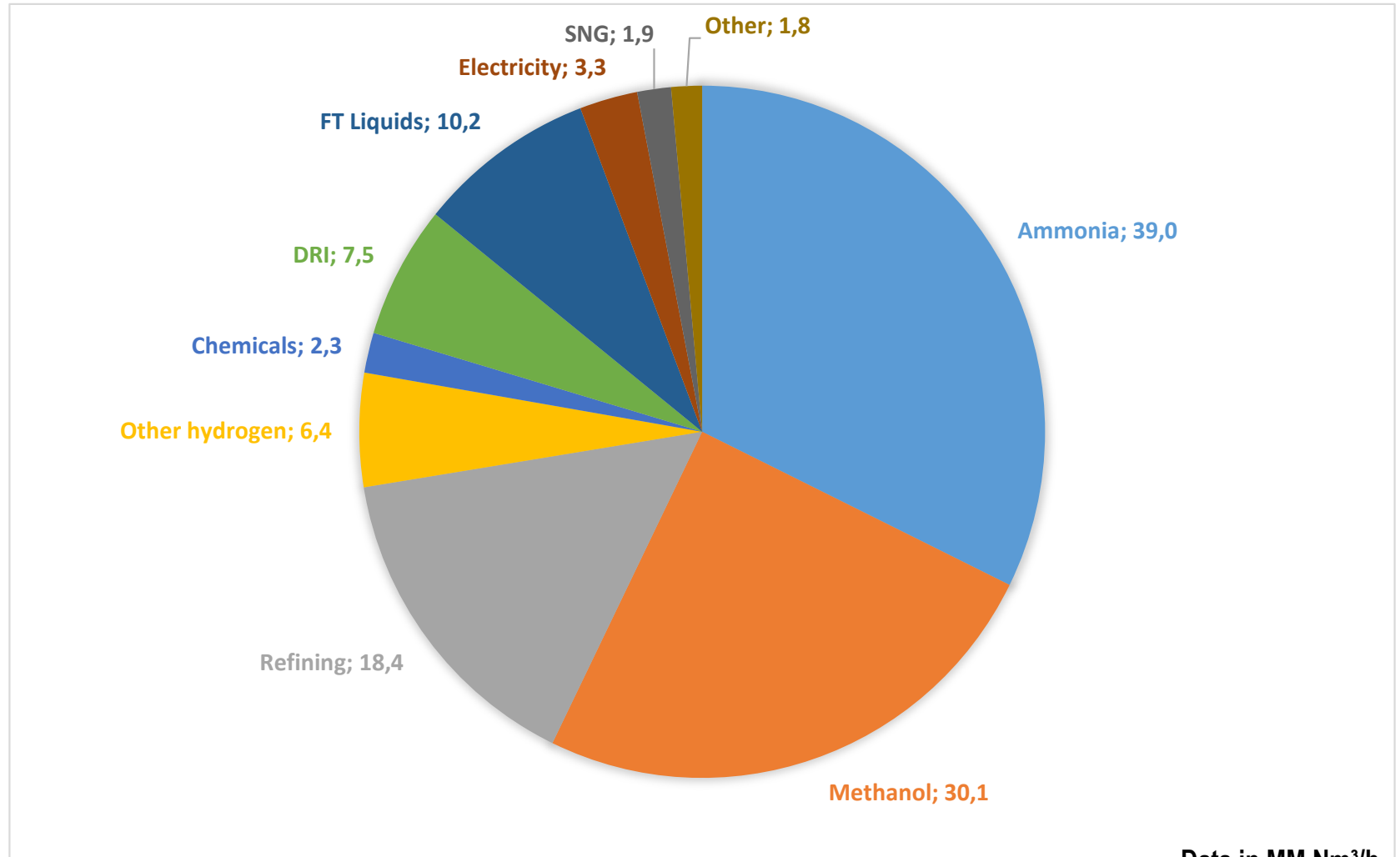
Syngas from Gasifiers



Data in MM Nm³/h

Source: GSTC Database, 2016

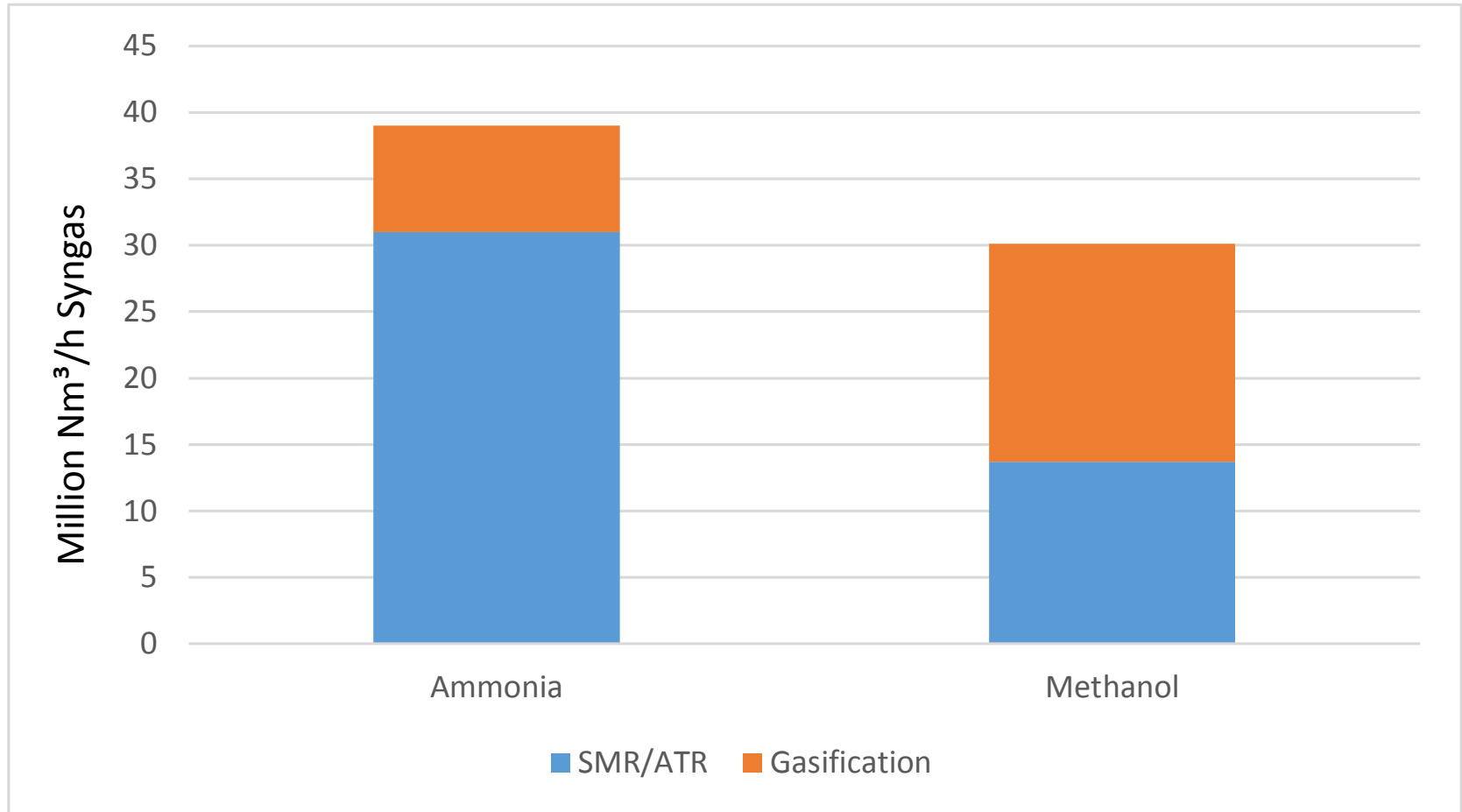
Total Syngas Market



Data in MM Nm³/h

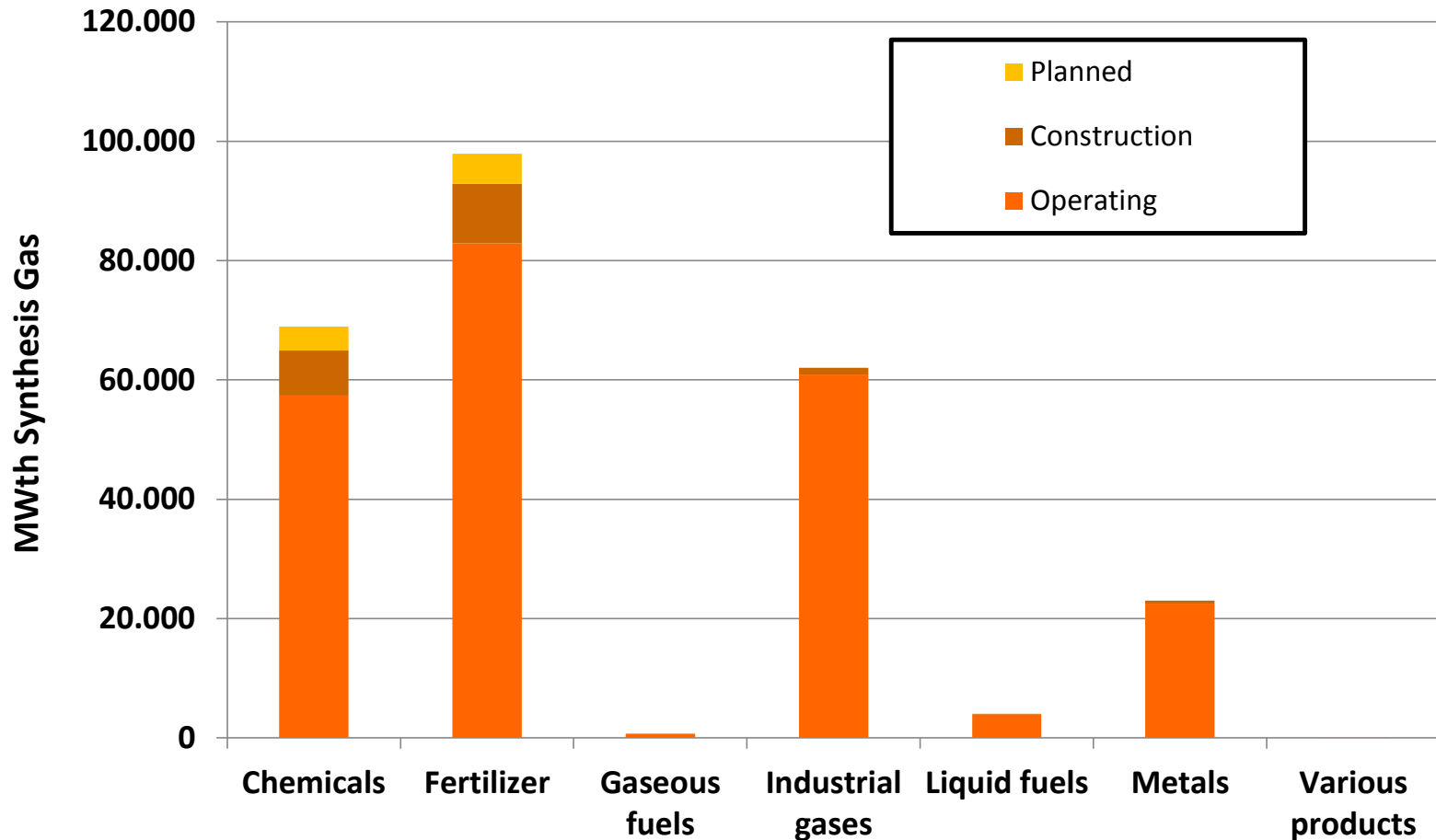
Source: GTC Database, 2016

Market Share by Technology Type



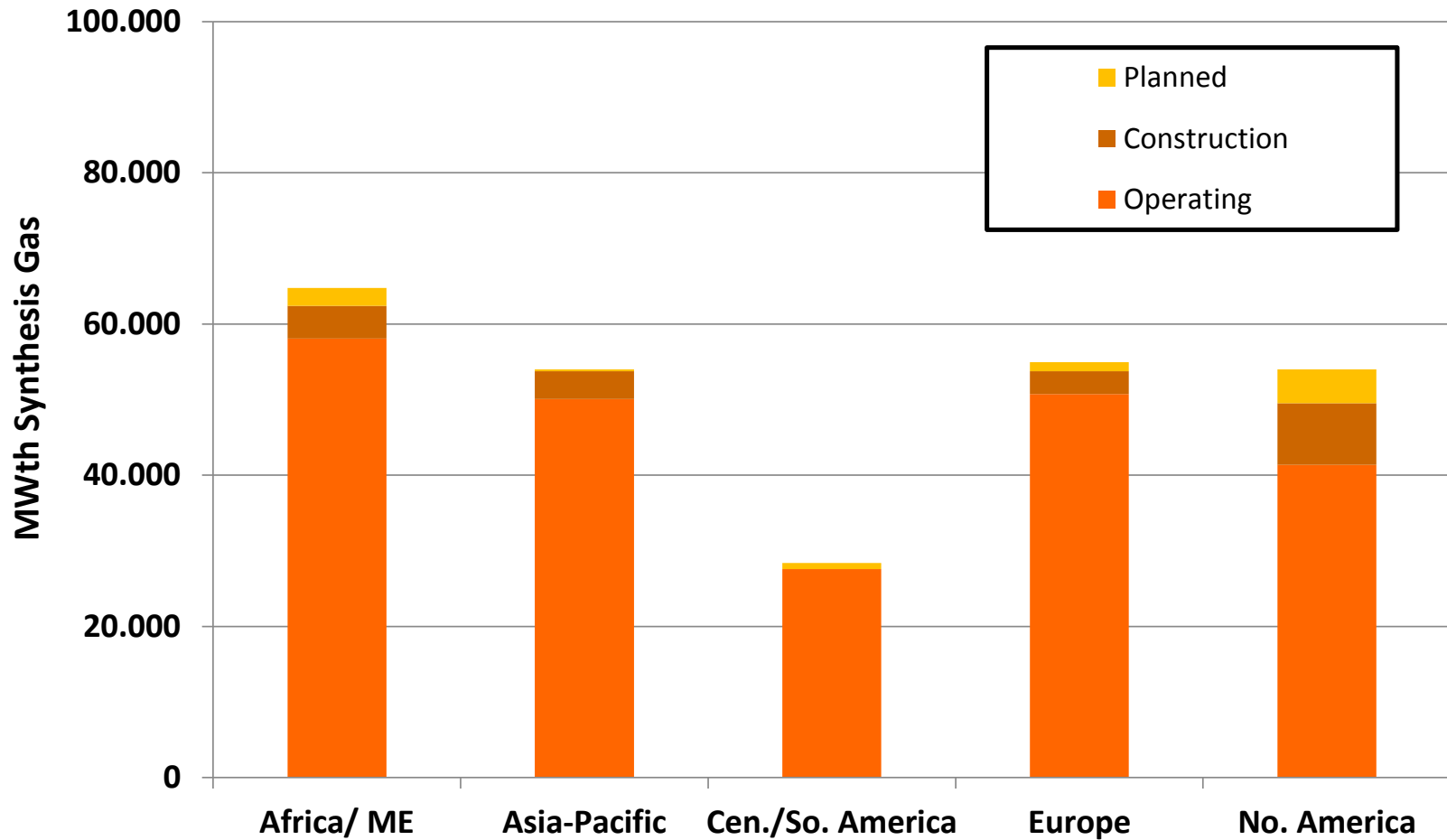
Source: GSTC Database, 2016

SMR/ATR Syngas by Application



Source: GSTC Database, 2016

SMR/ATR Syngas by Region



Source: GSTC Database, 2016

Conclusions

- **No major changes since last year.**
- **Wide size variation in biomass gasifiers.**
- **New reformer syngas database including nearly 1000 projects.**

Acknowledgements

- **Gasification Technologies Council.**
- **Technology licensors, plant owners and others for contribution of project data.**
- **Steve Jenkins for help on biomass and waste gasifiers.**

- **Any additions/corrections are always welcome**
chris@higman.de