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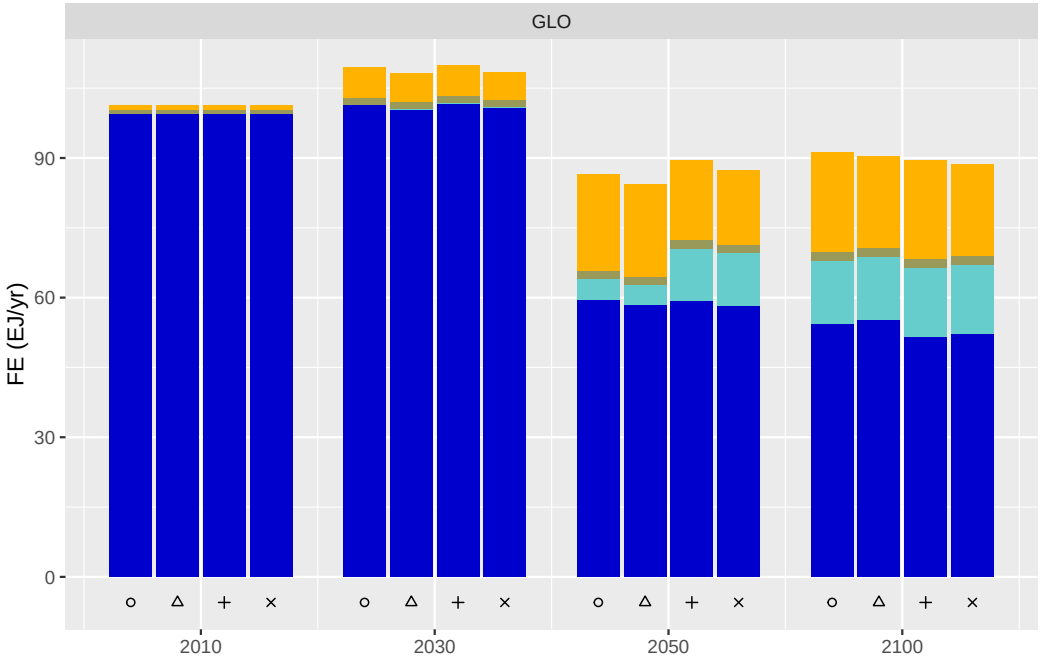
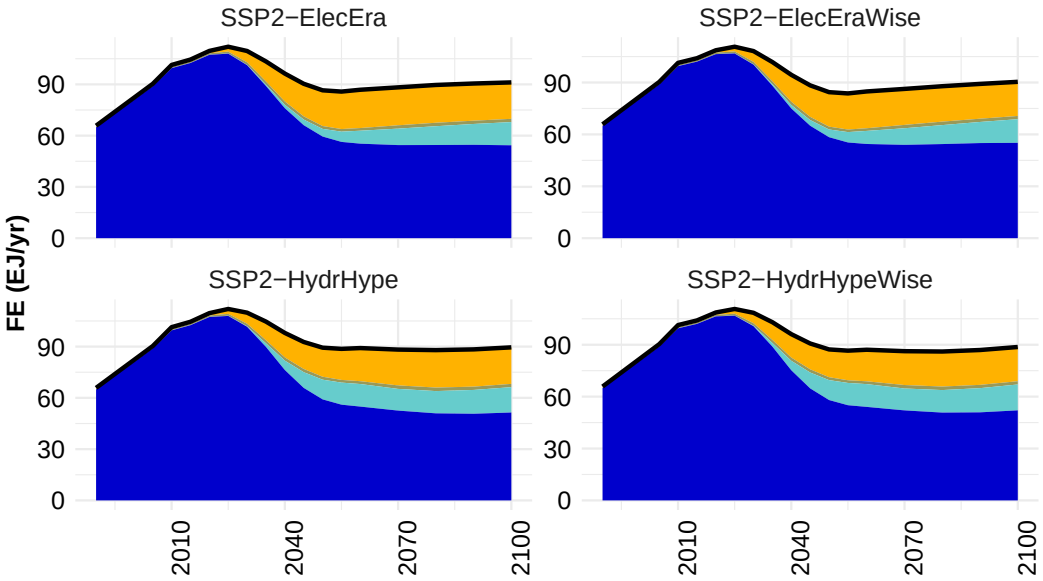
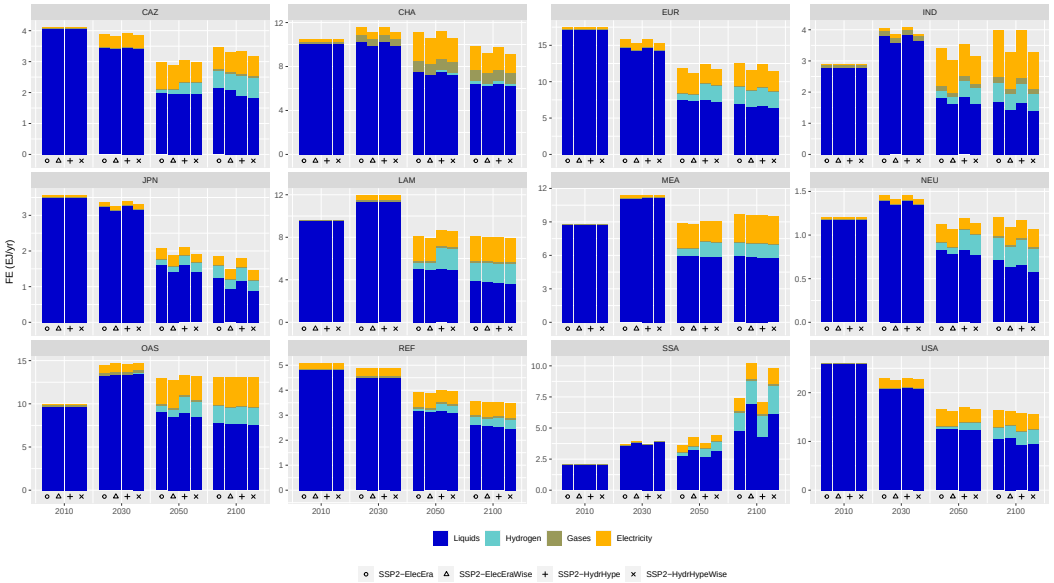
1 Energy

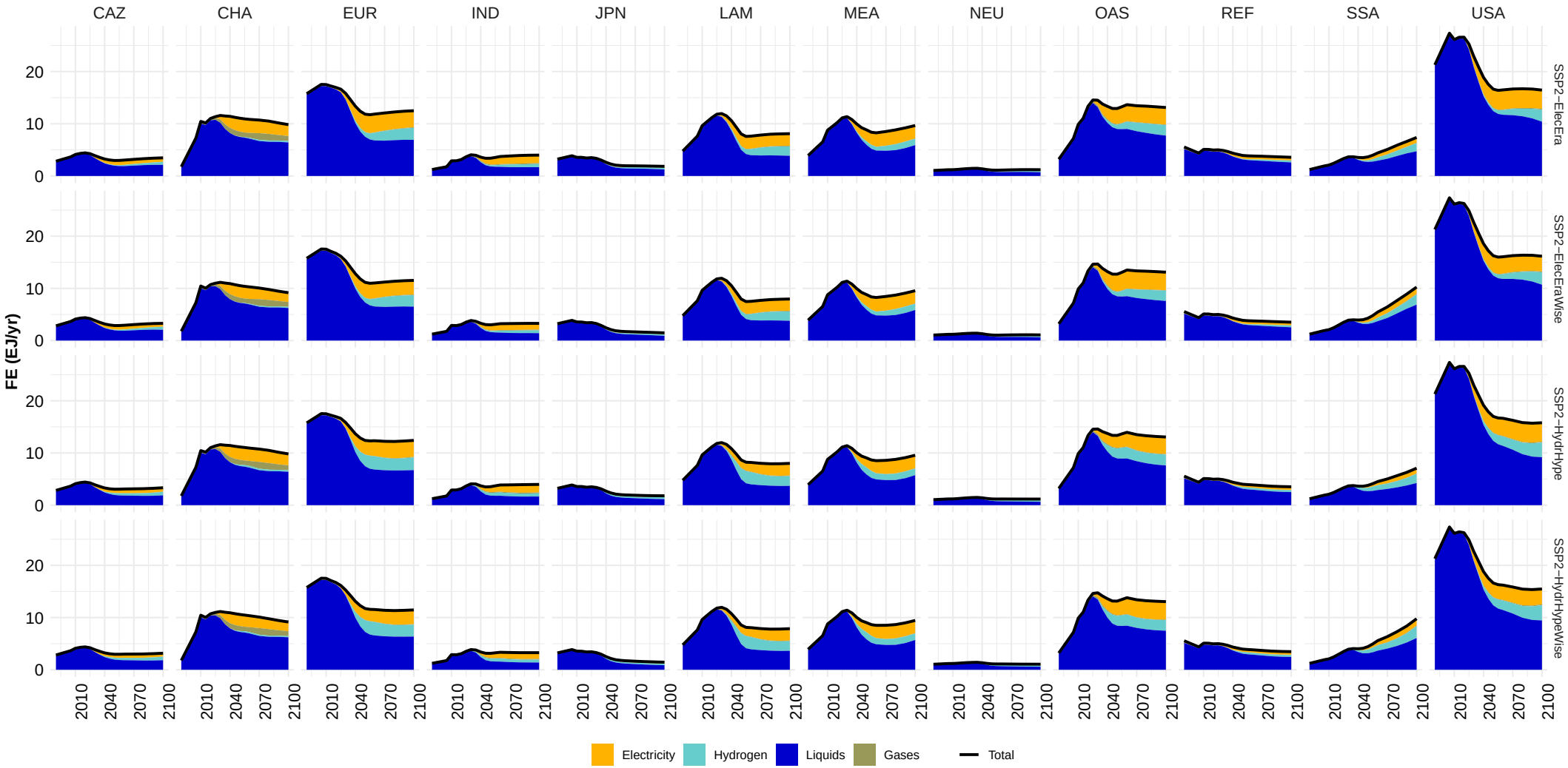
1.1 Final energy by carrier

1.1.1 Total

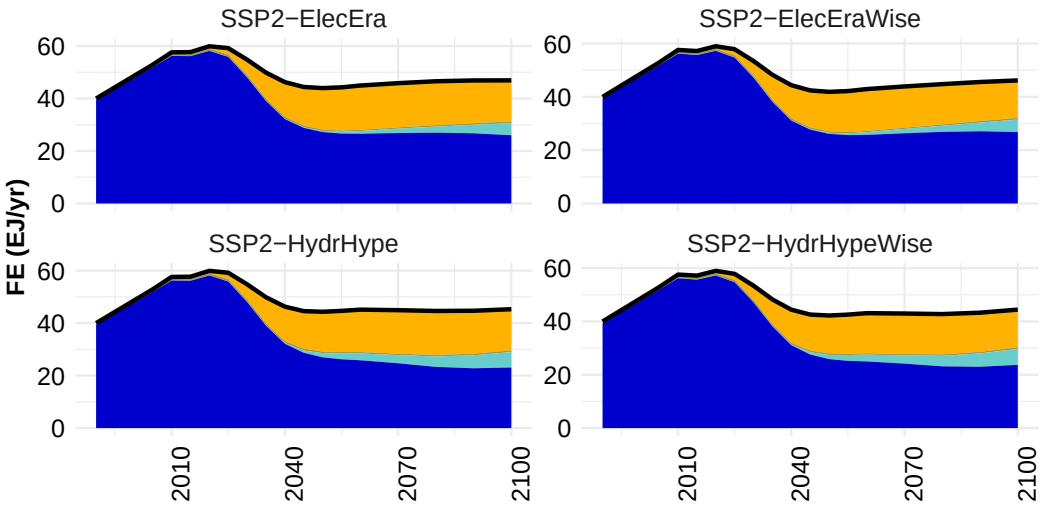


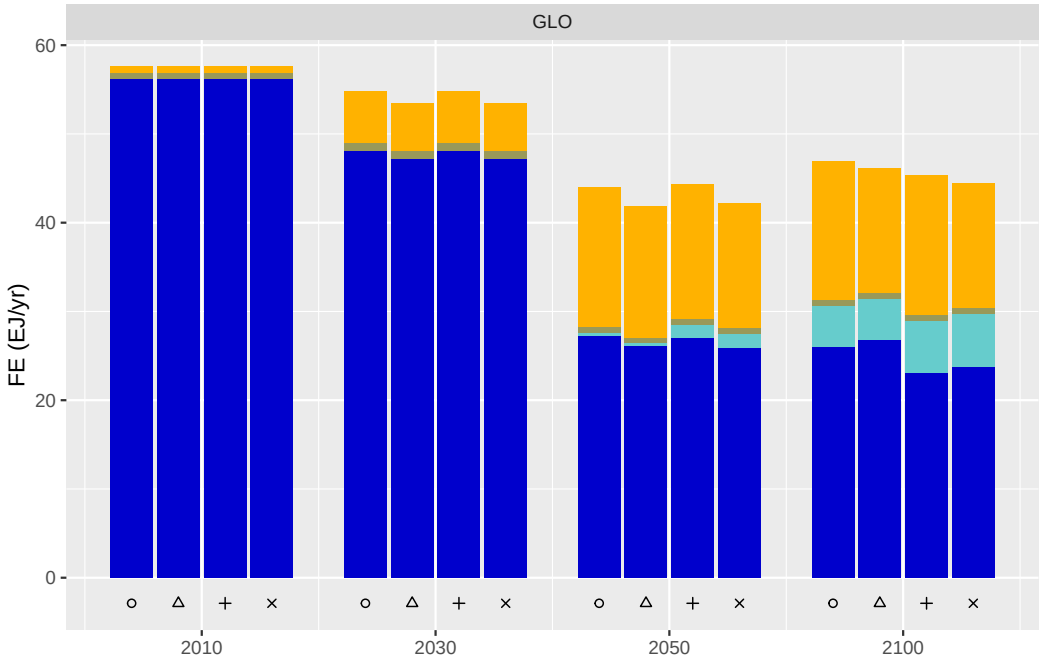


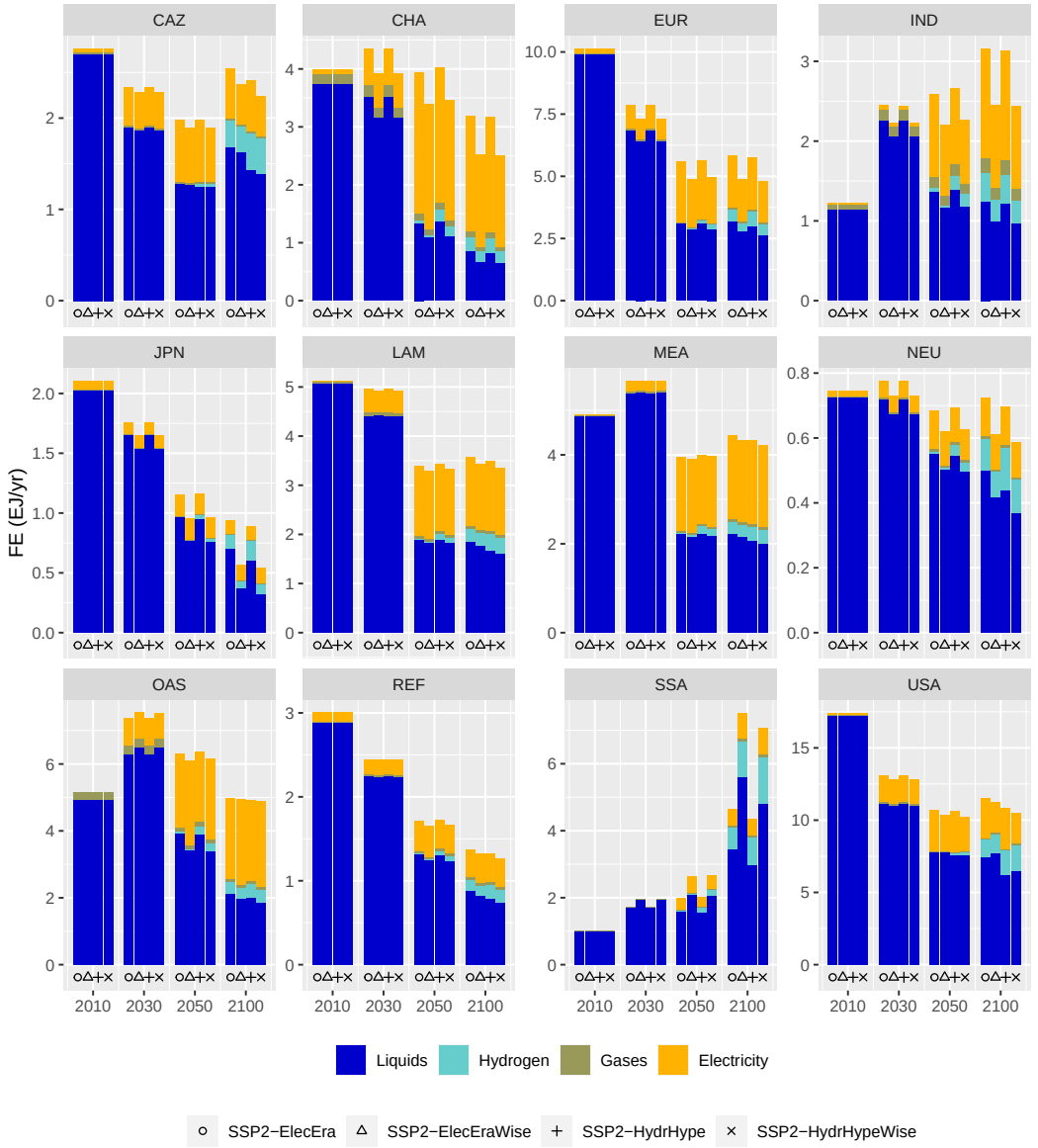


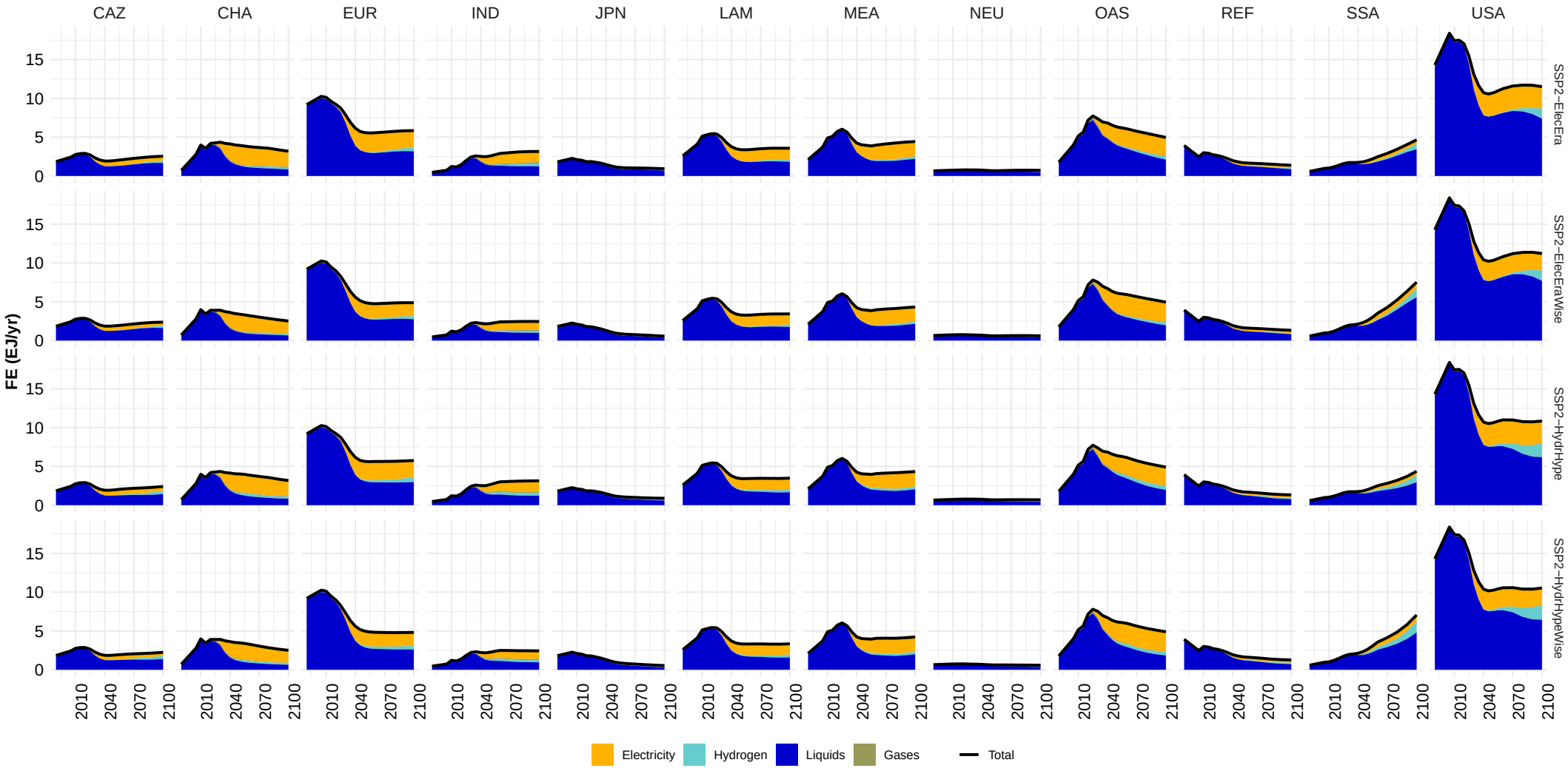

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
FE (EJ/yr)
0
10
20
2010
2040
2070
2100
Electricity
Hydrogen
Liquids
Gases
Total

1.1.2 Passenger








CAZ
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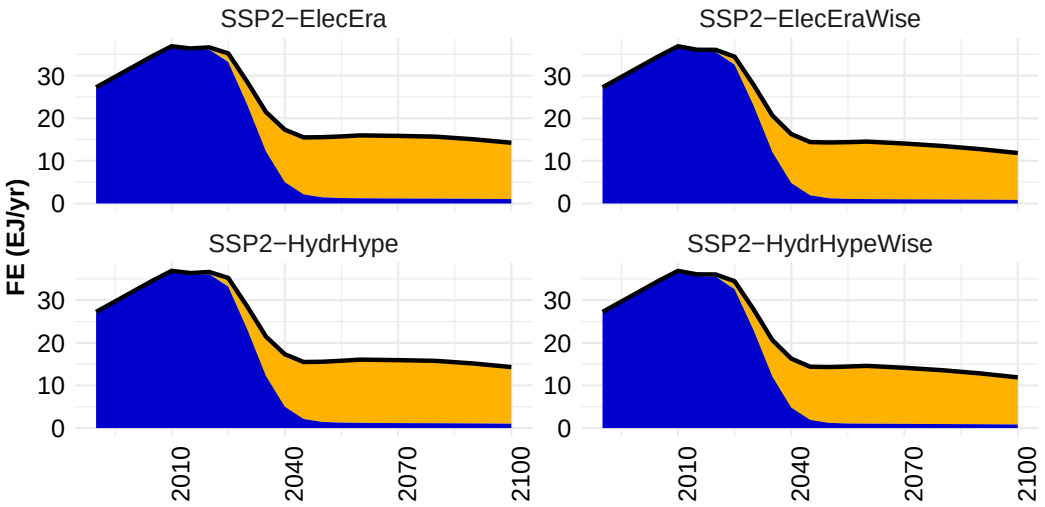
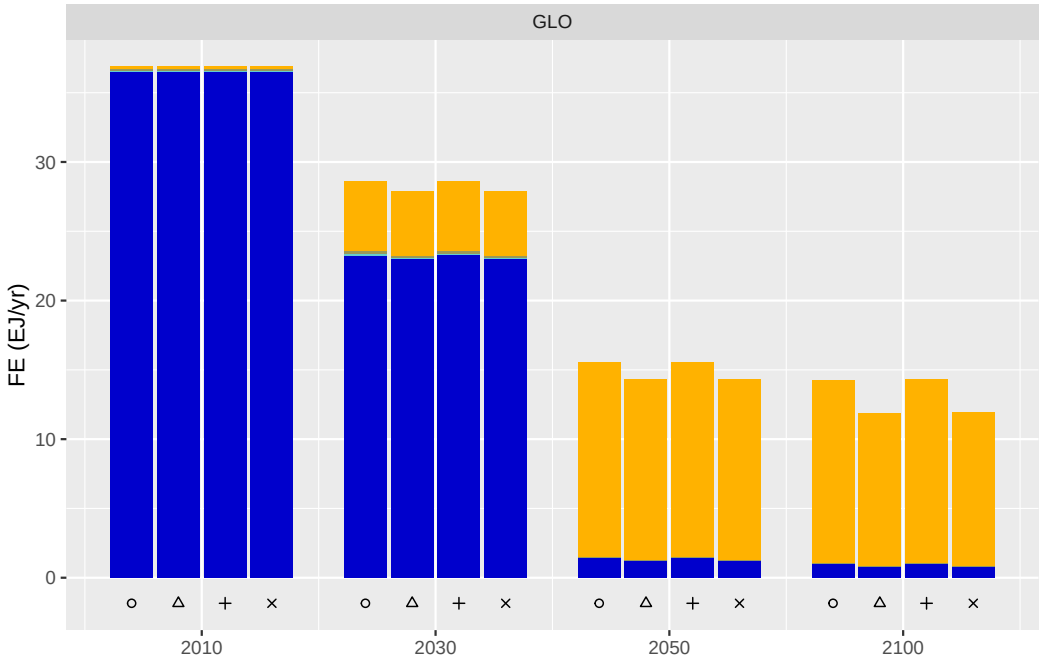
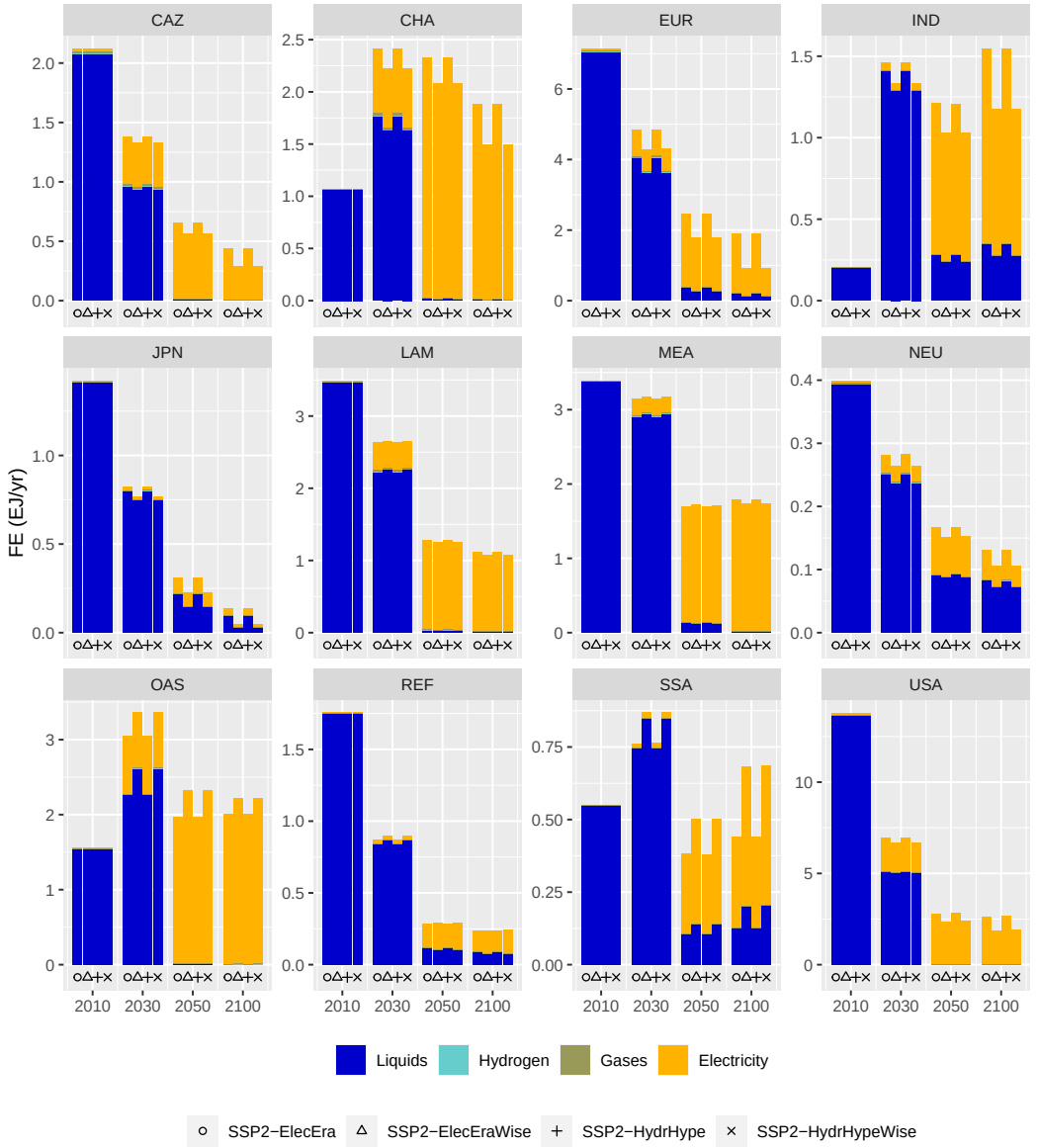
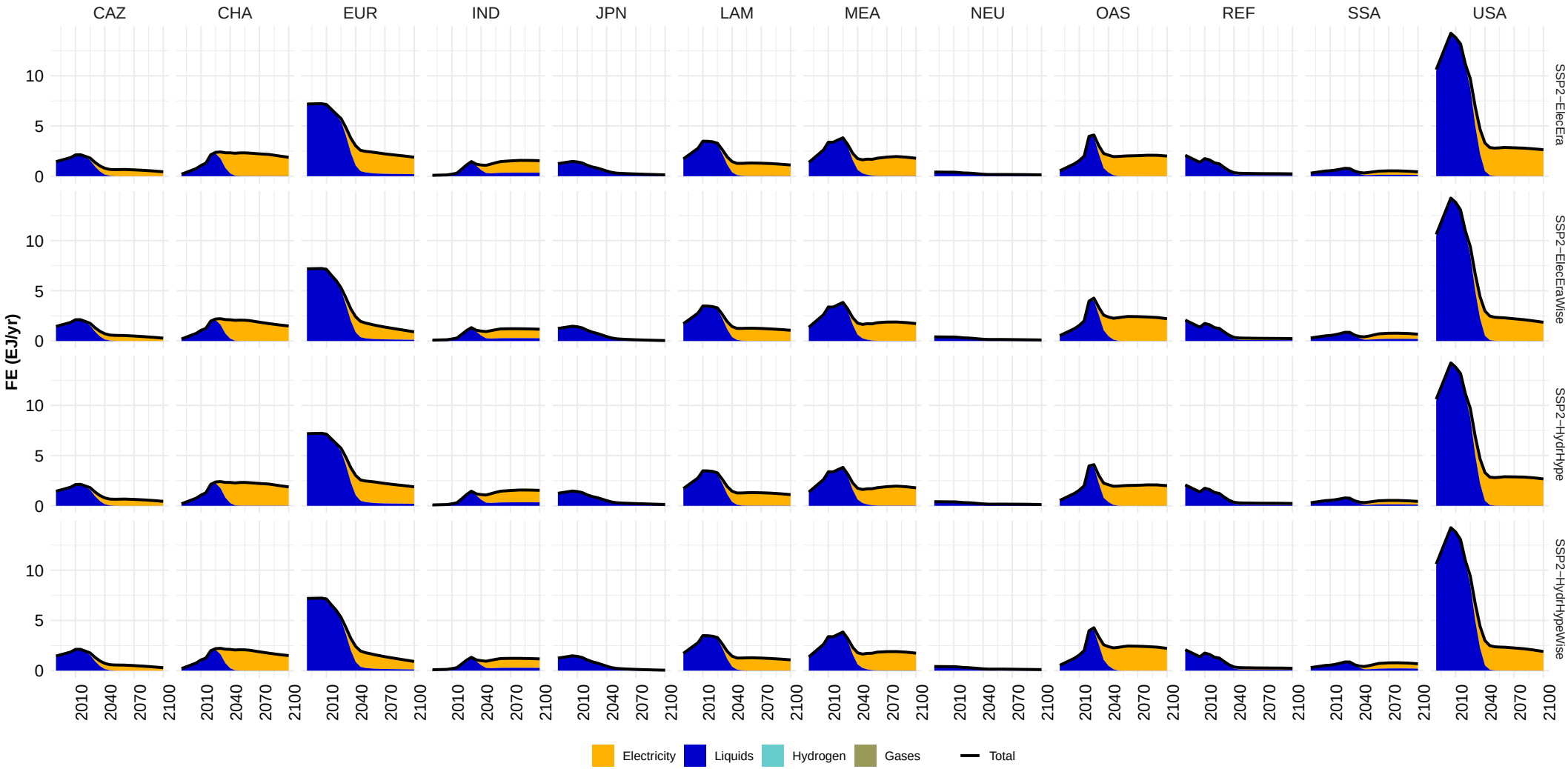
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
FE (EJ/yr)
0
5
10
15
2010
2040
2070
2100
Electricity
Hydrogen
Liquids
Gases
Total

1.1.3 Passenger LDV

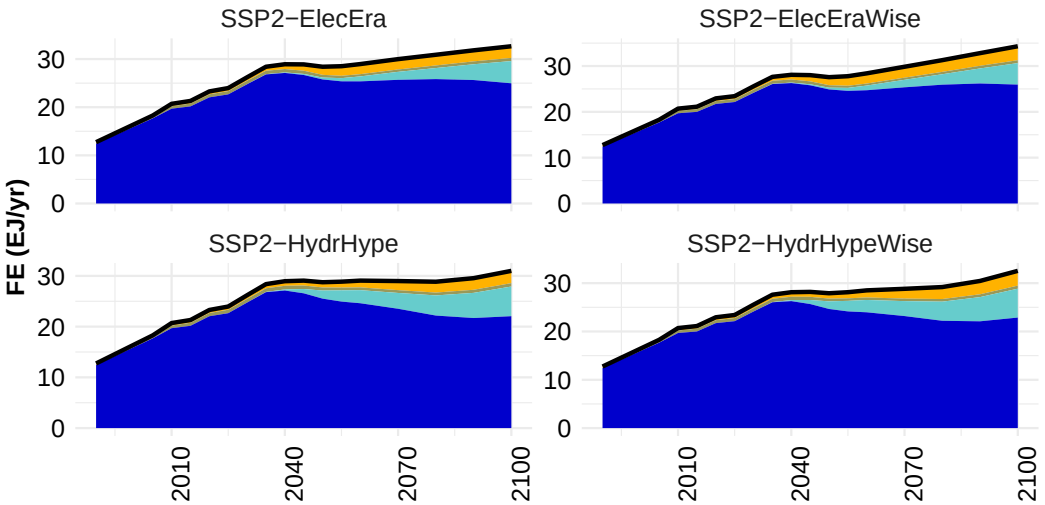


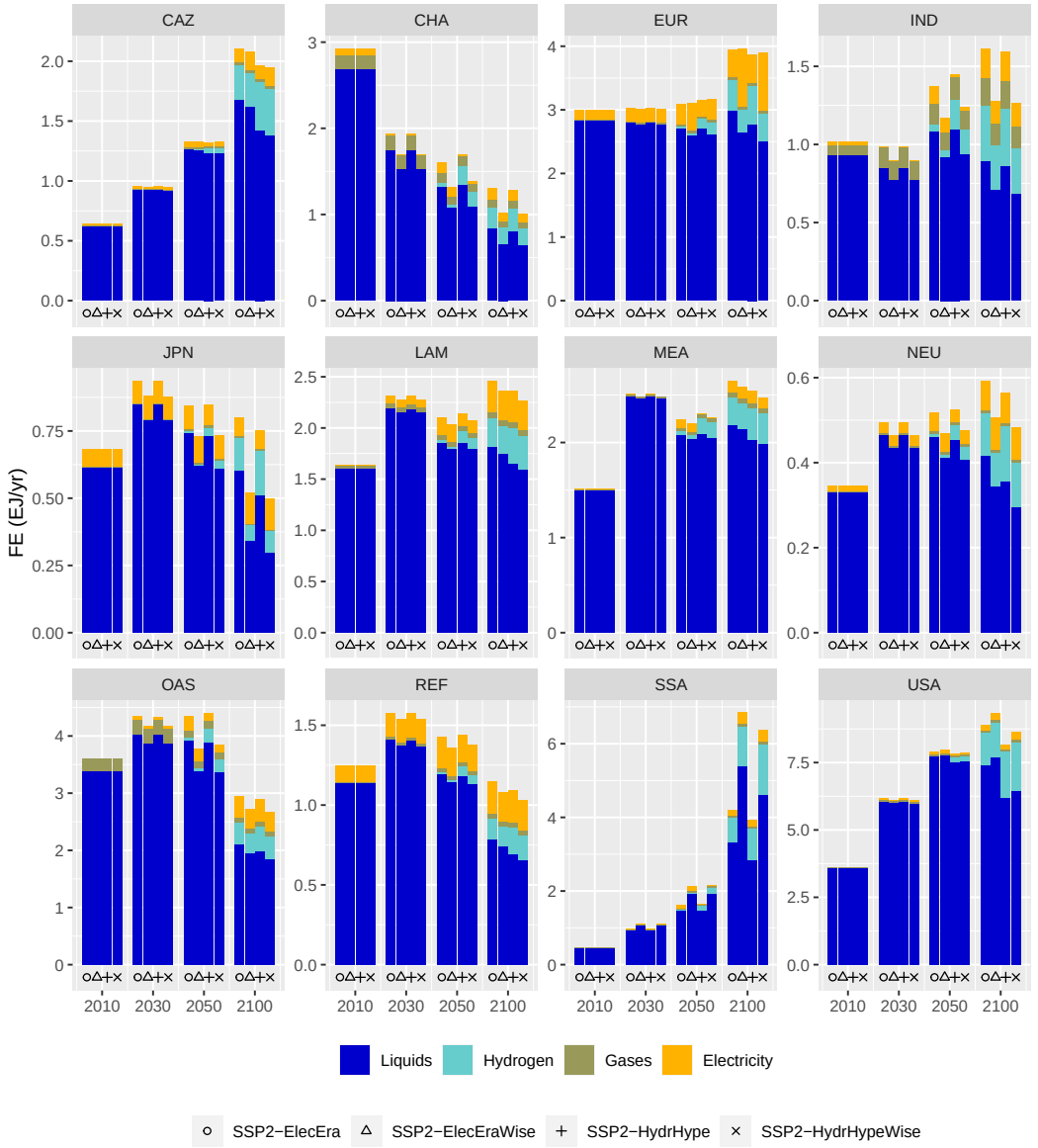


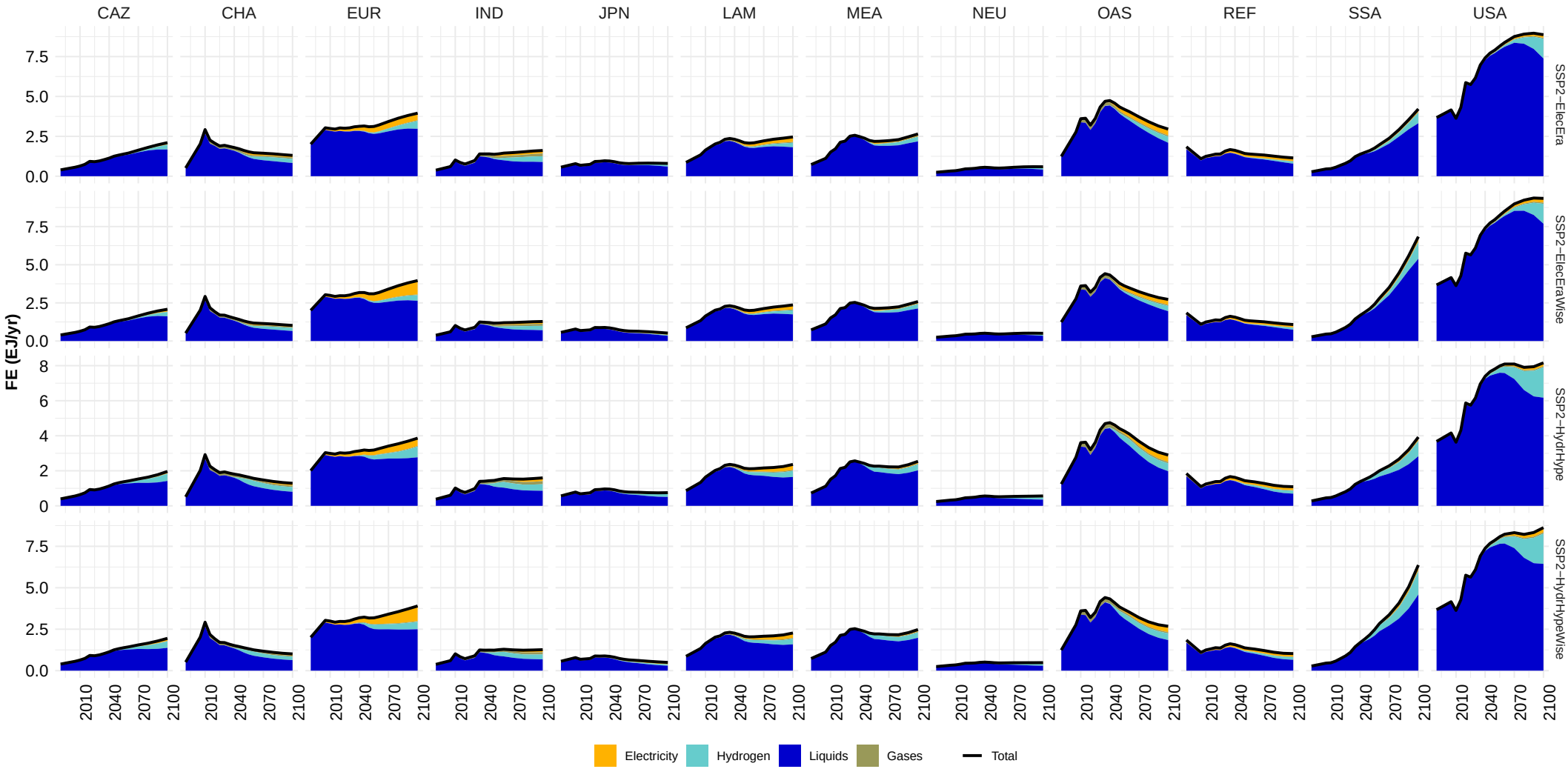



CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
FE (EJ/yr)
0
5
10
2010
2040
2070
2100
Electricity
Liquids
Hydrogen
Gases
Total

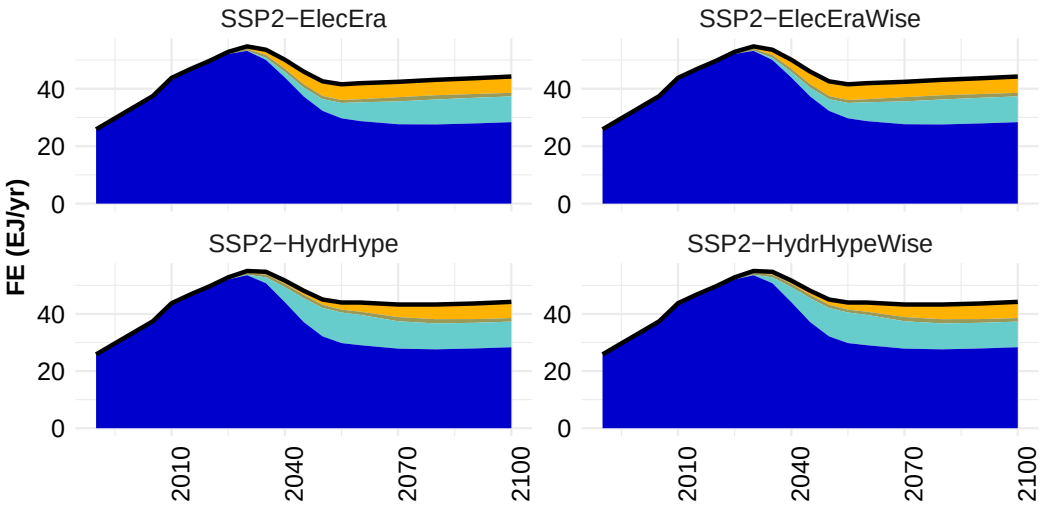
1.1.4 Passenger non-LDV

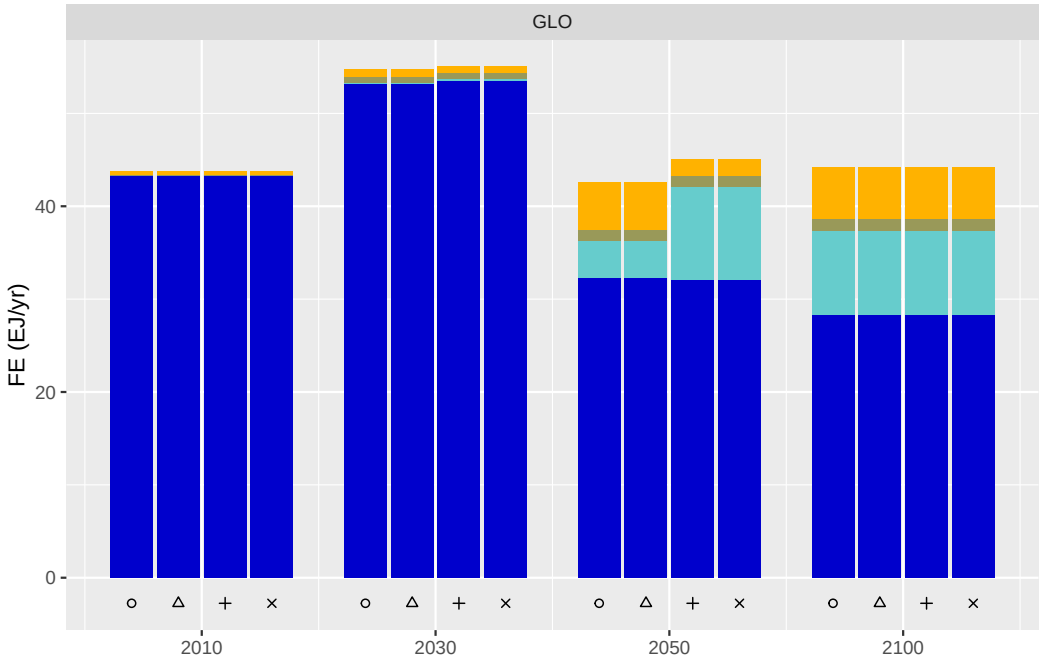


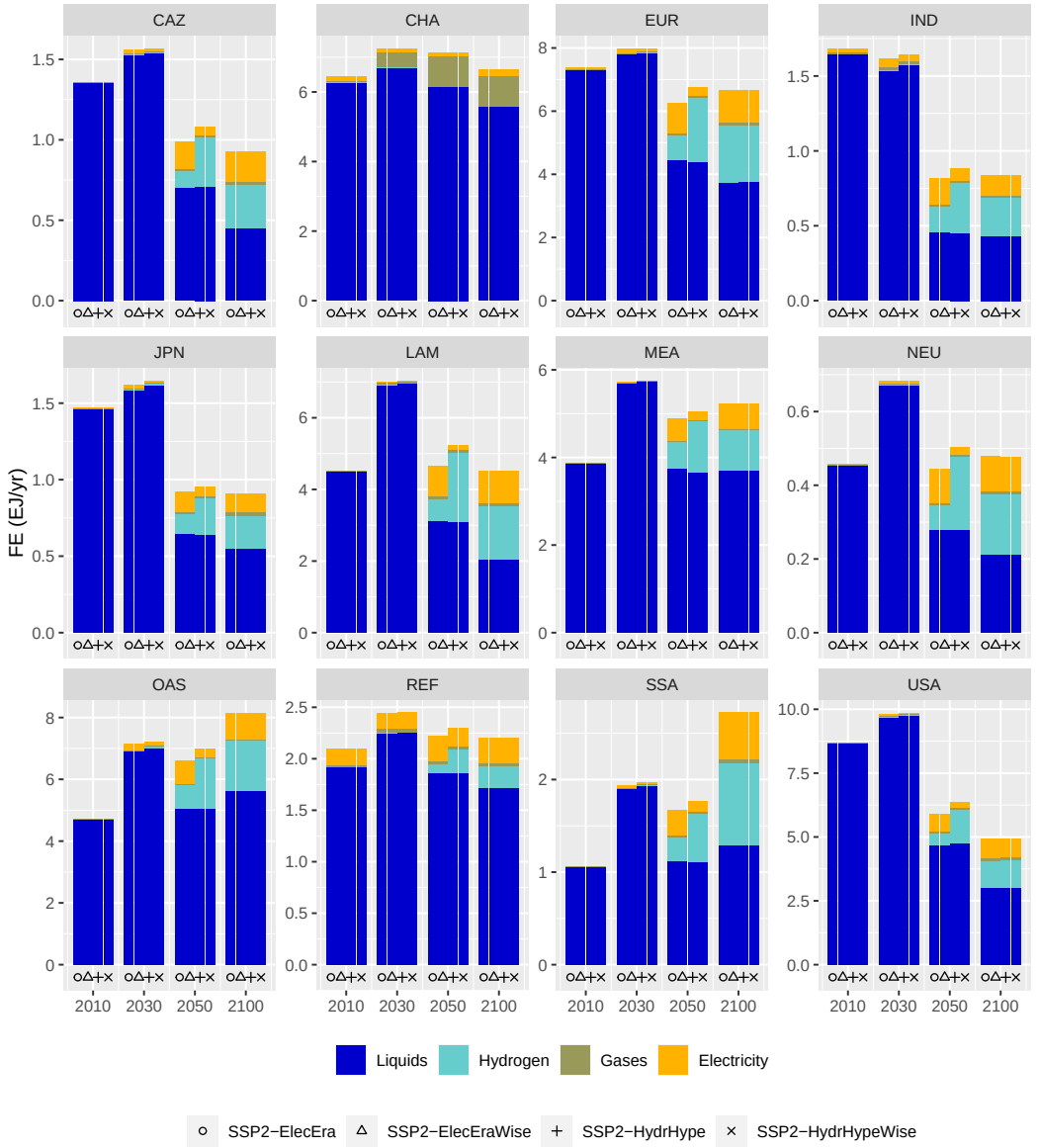



CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
FE (EJ/yr)
0.0
2.5
5.0
7.5
0
2
4
6
8
2010
2040
2070
2100
Electricity
Hydrogen
Liquids
Gases
Total

1.1.5 Freight


SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
FE (EJ/yr)
0
20
40
2010
2040
2070
2100


GLO
FE (EJ/yr)
0
20
40
2010
2030
2050
2100
o △ + ×


CAZ
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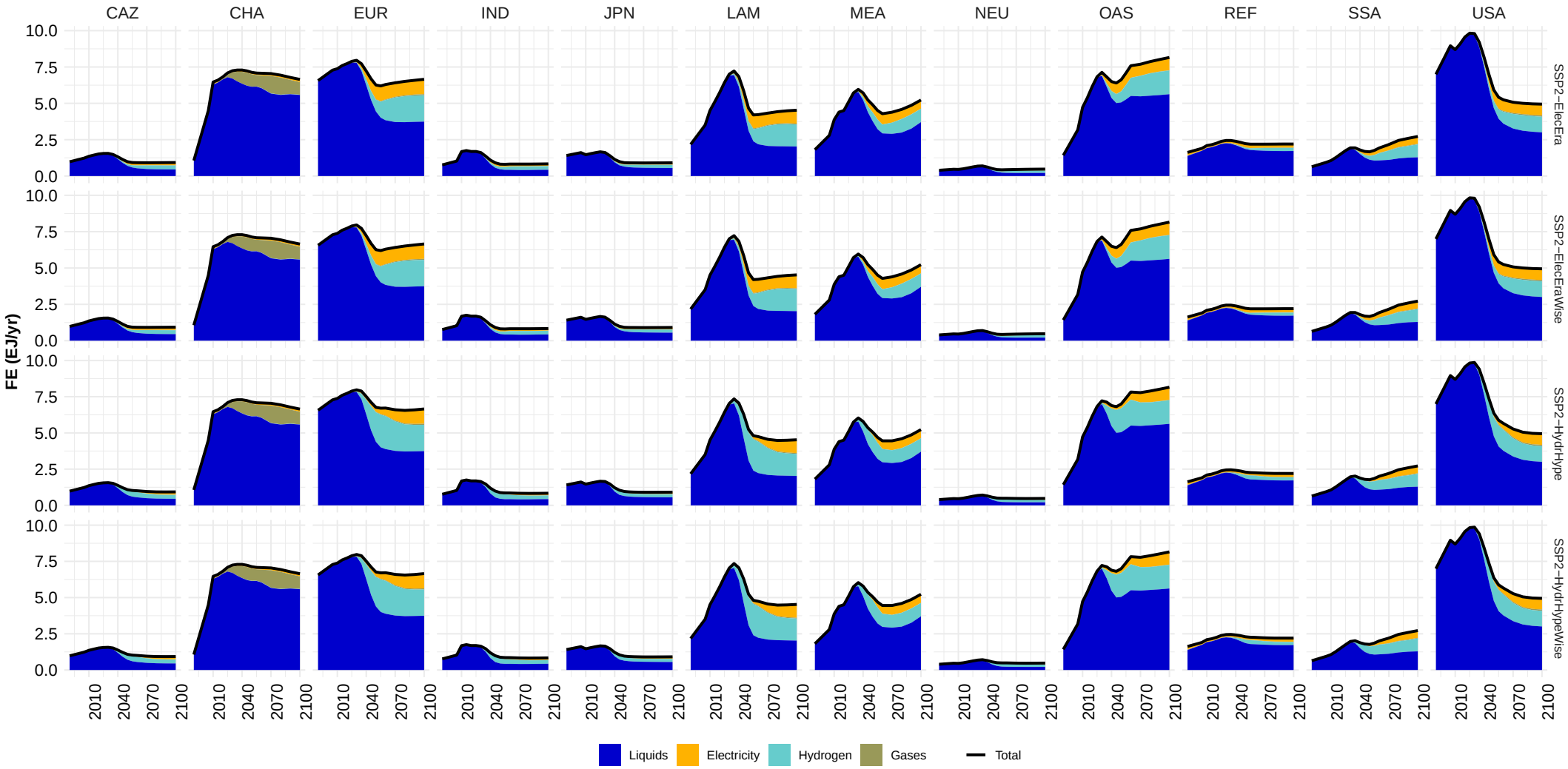
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
FE (EJ/yr)
o△+×
2010
2030
2050
2100
Liquids
Hydrogen
Gases
Electricity
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise


CAZ
CHA
EUR
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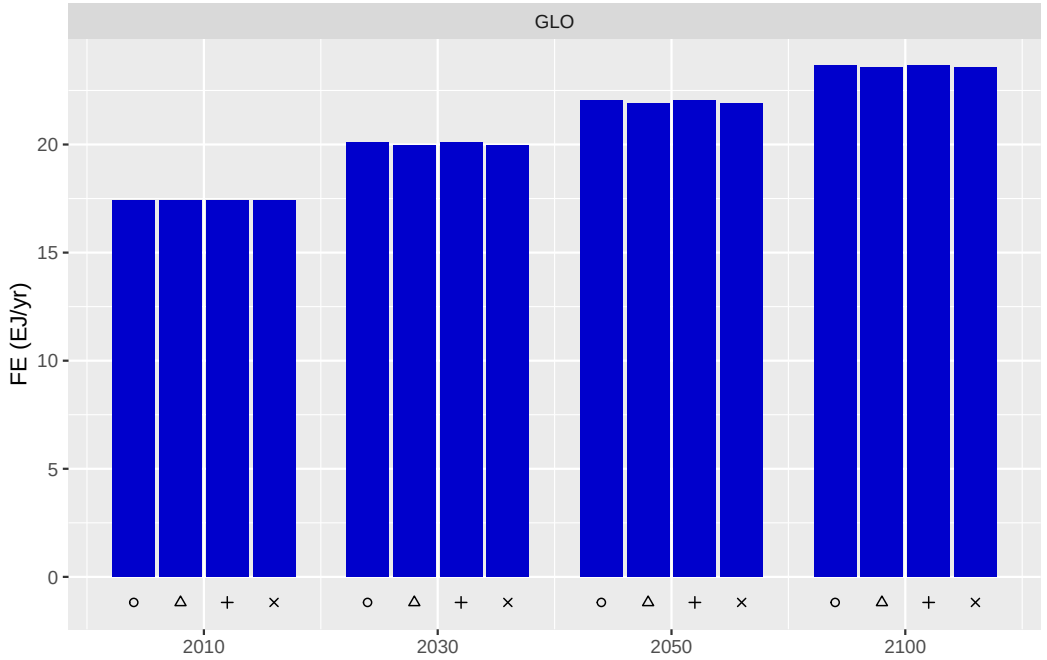
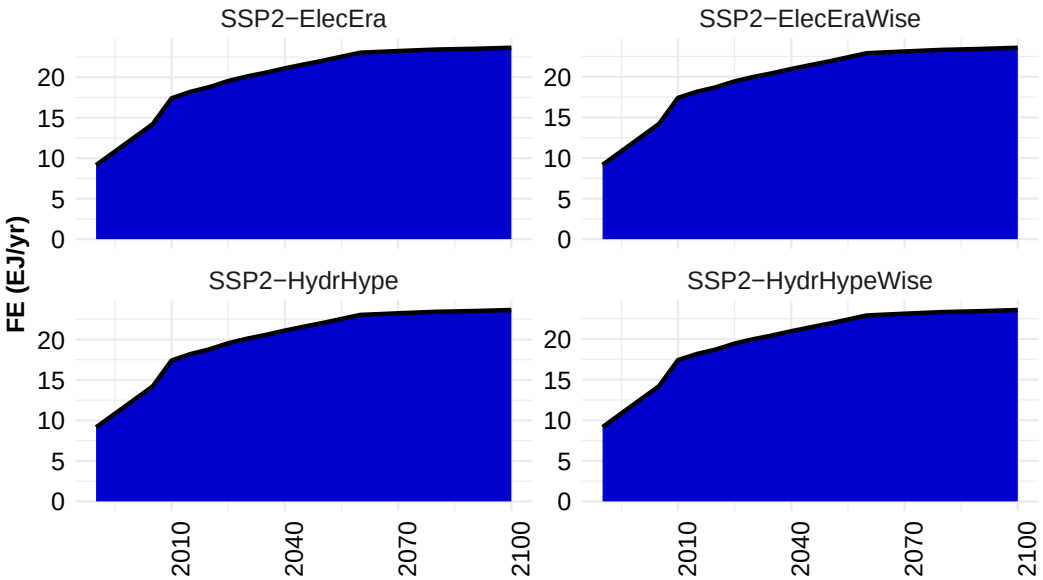
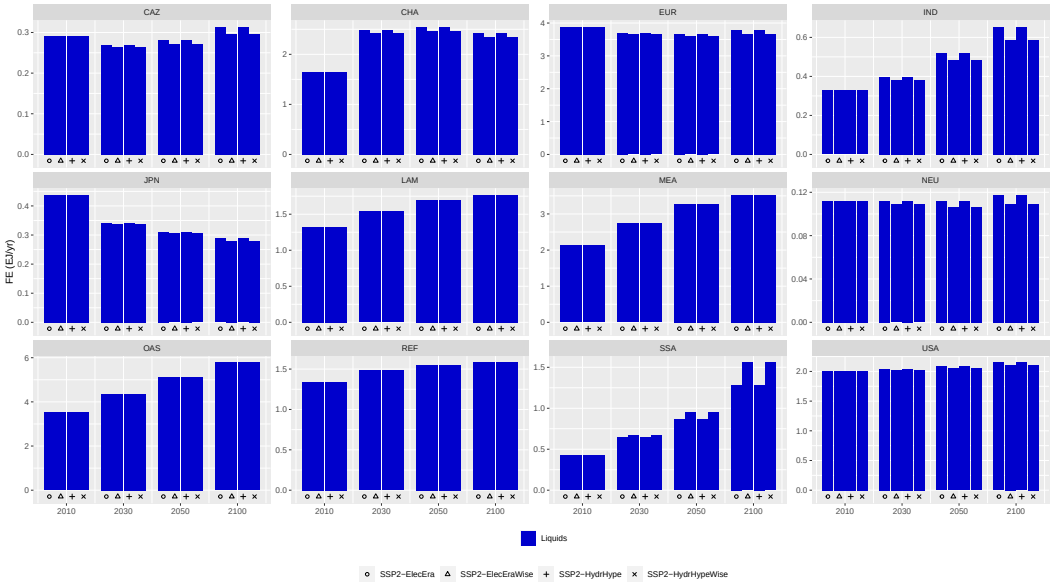
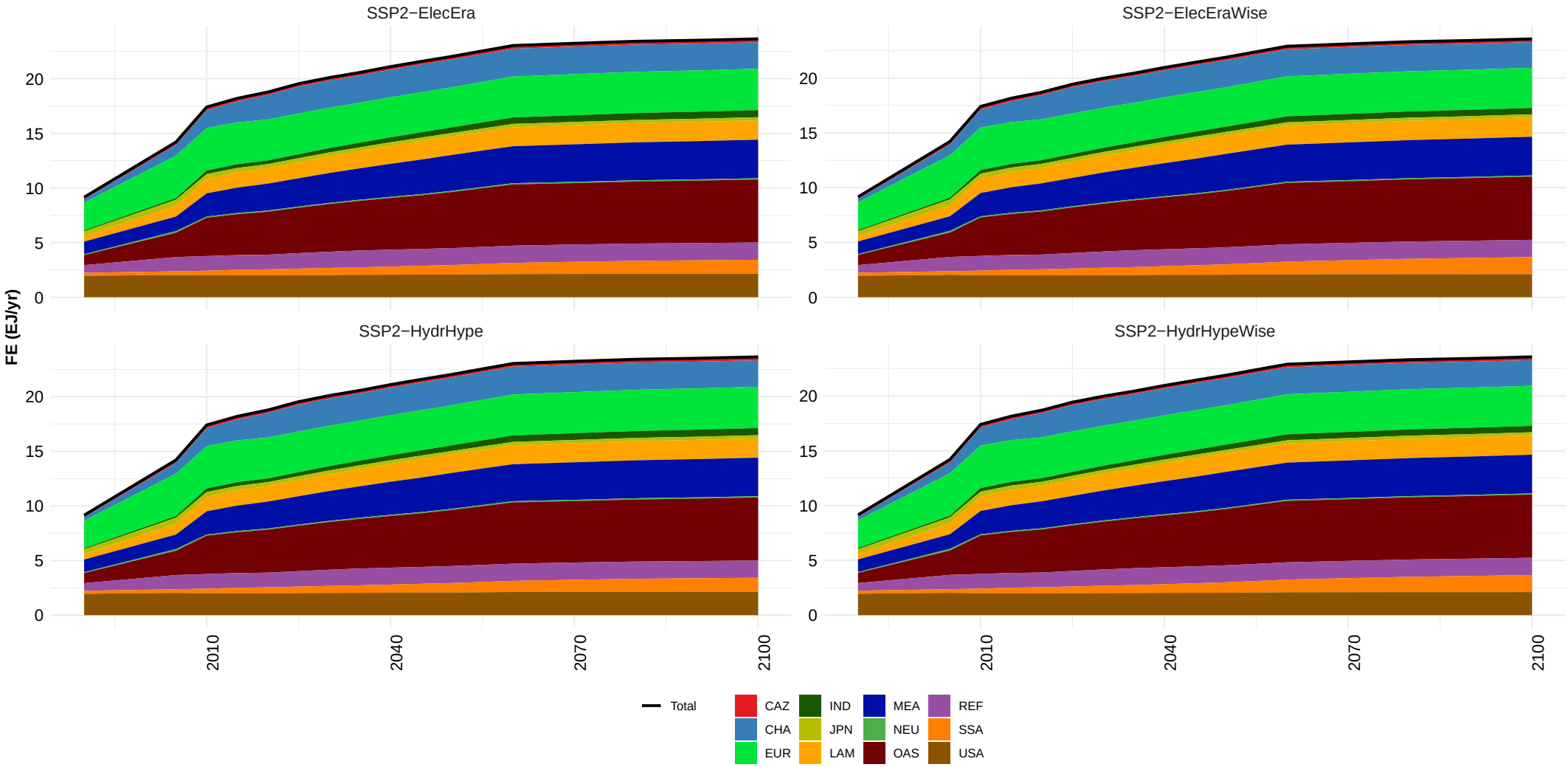
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
FE (EJ/yr)
10.0
7.5
5.0
2.5
0.0
2010
2040
2070
2100
Liquids
Electricity
Hydrogen
Gases
Total

1.1.6 Bunkers

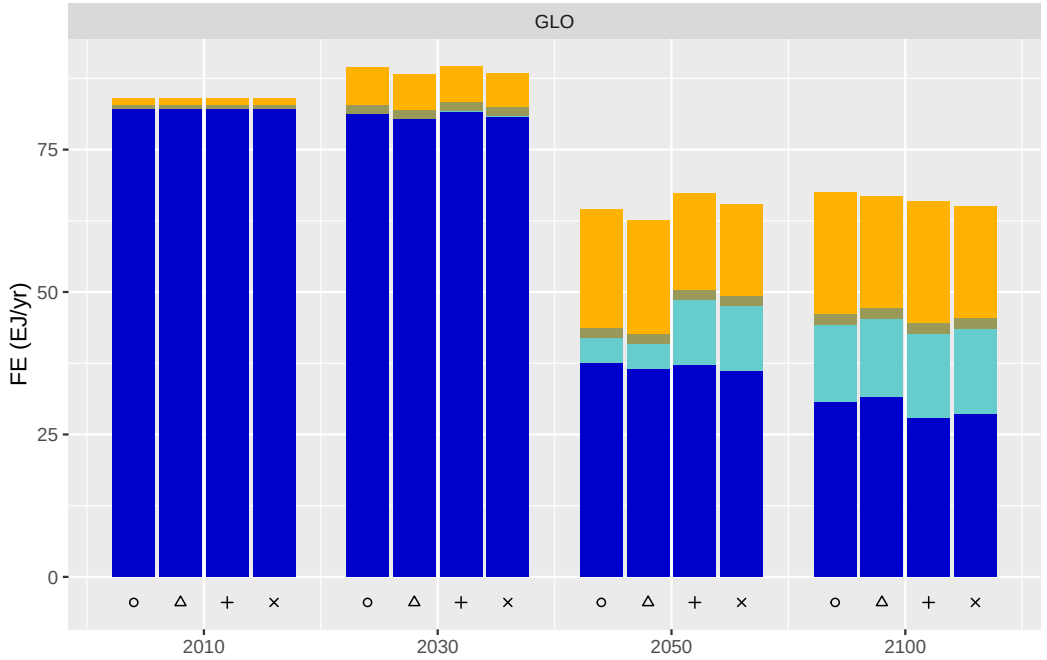

GLO
FE (EJ/yr)
0
5
10
15
20
2010
2030
2050
2100

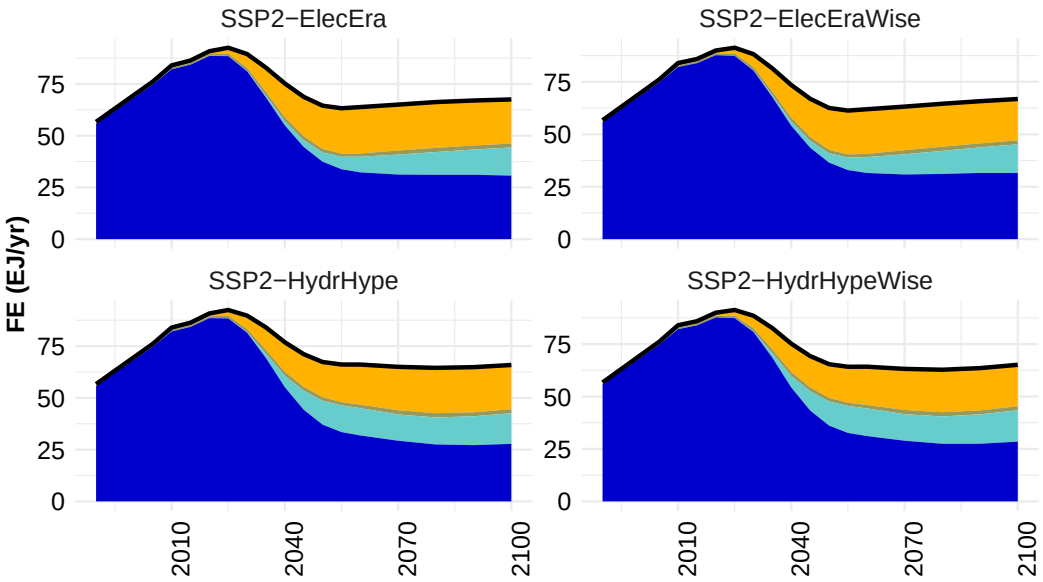

SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
FE (EJ/yr)
0
5
10
15
20
2010
2040
2070
2100

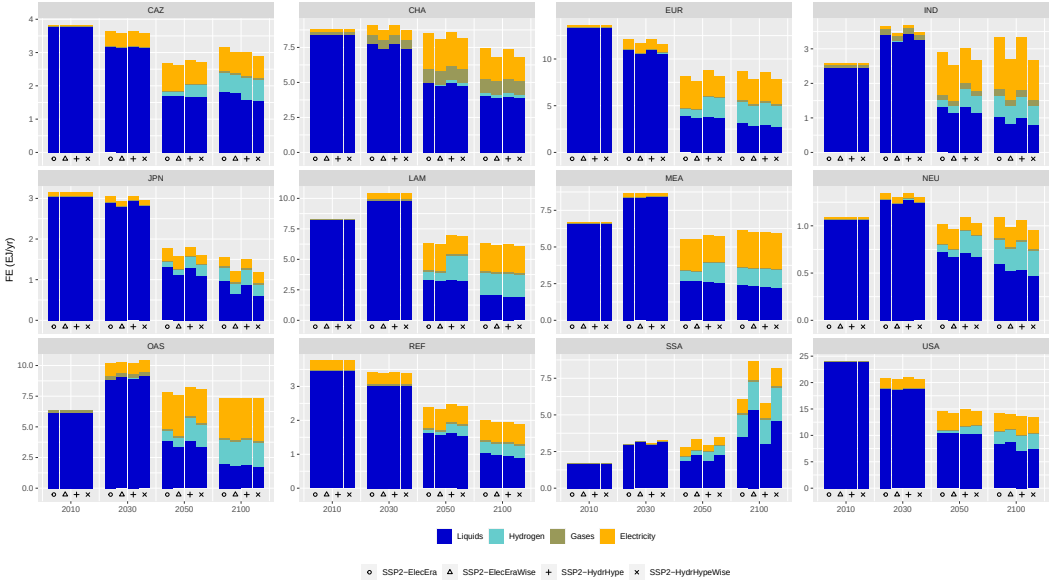

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
FE (EJ/yr)
2010
2030
2050
2100
Liquids
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise

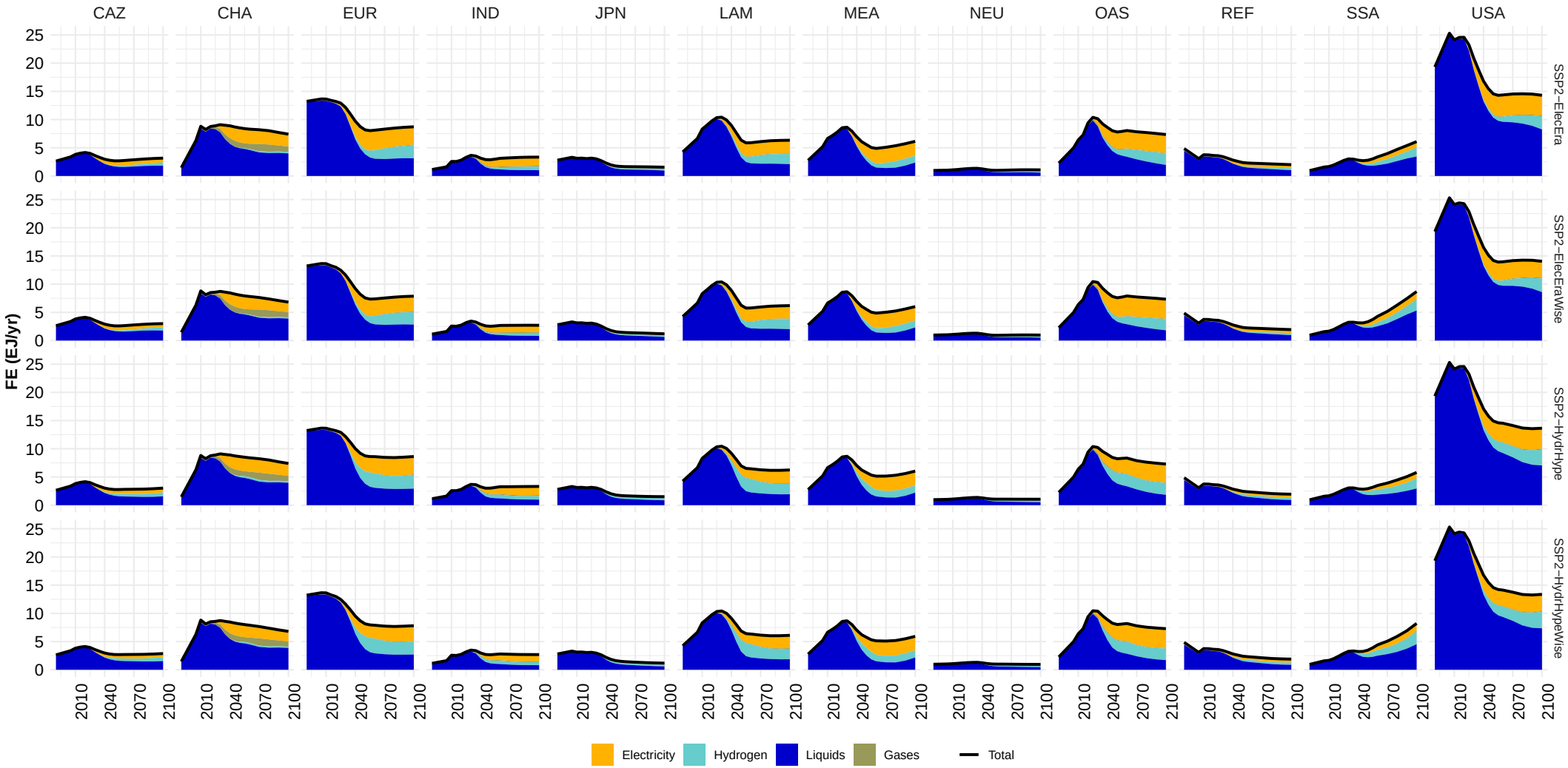

SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
FE (EJ/yr)
0
5
10
15
20
2010
2040
2070
2100
Total
CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA

1.1.7 W/O Bunkers

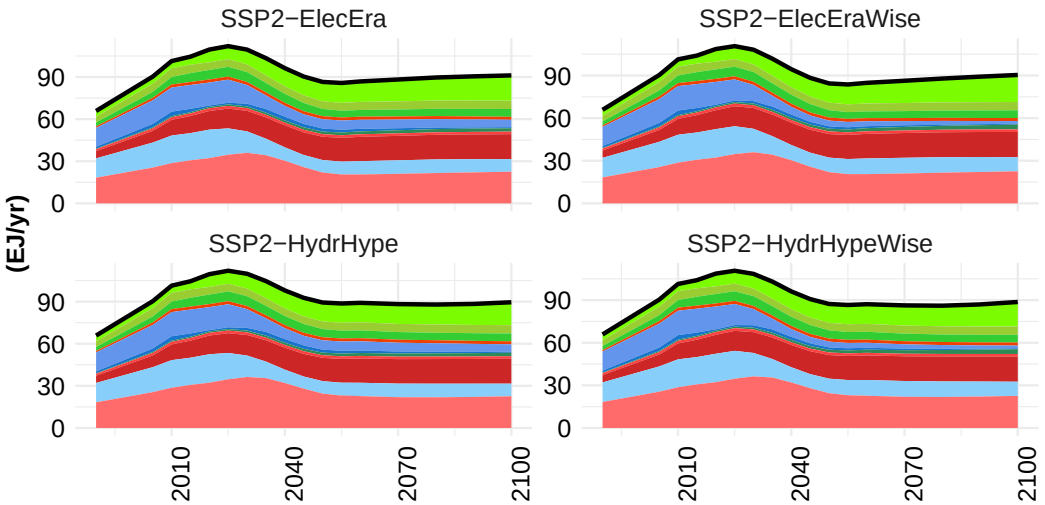


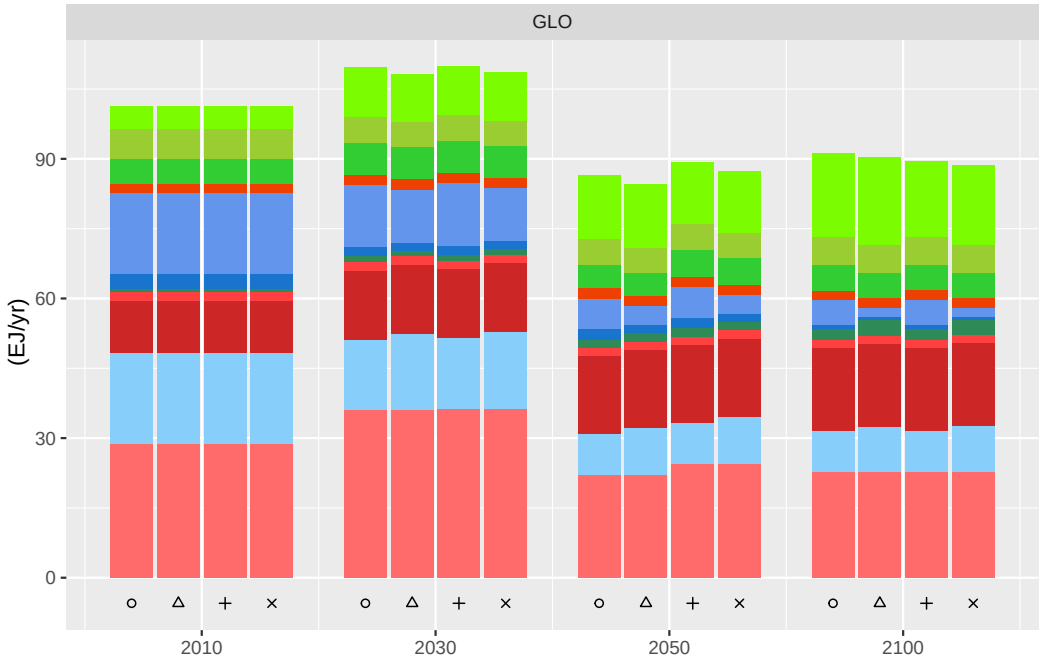


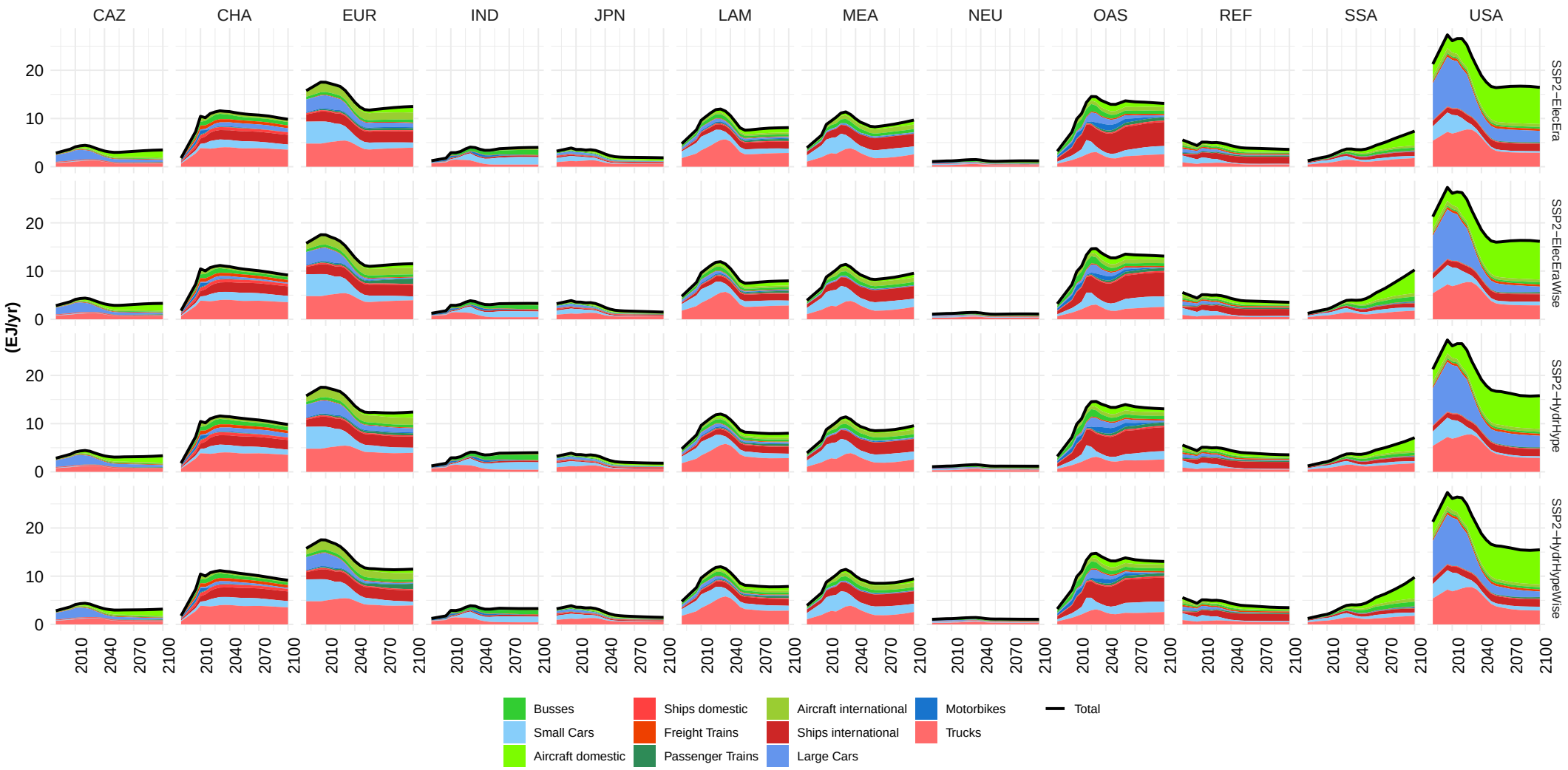



CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
FE (EJ/yr)
0
5
10
15
20
25
2010
2040
2070
2100
Electricity
Hydrogen
Liquids
Gases
Total

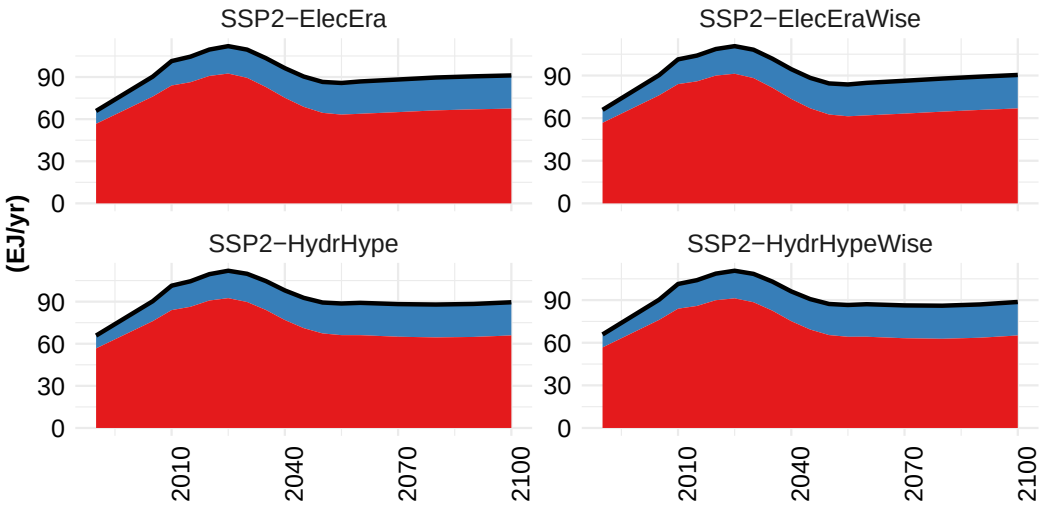
1.2 Final energy by transport modes

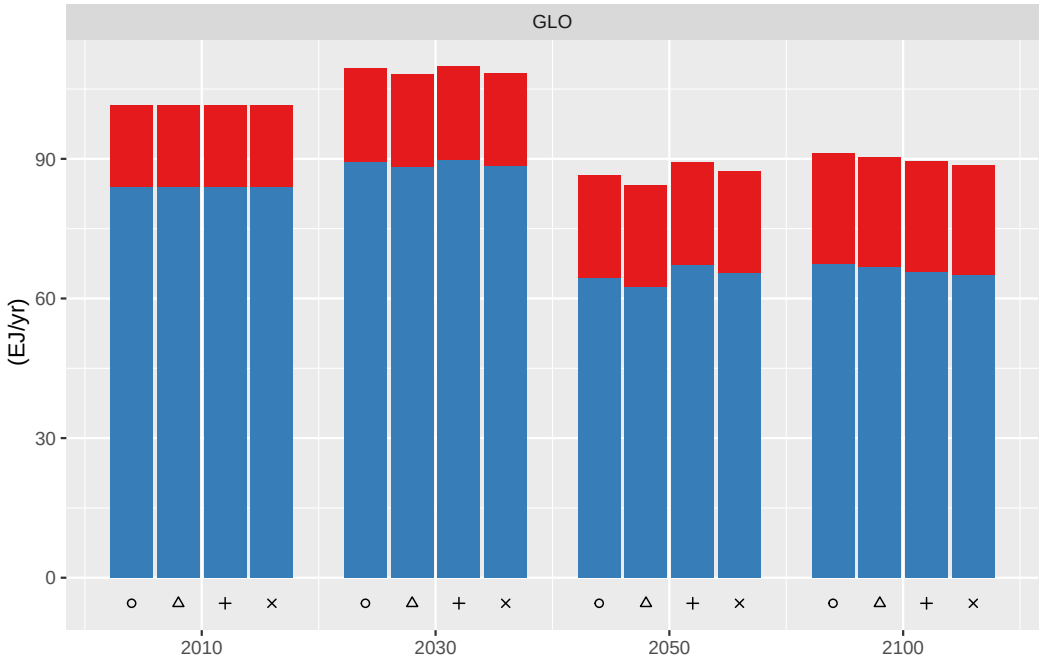


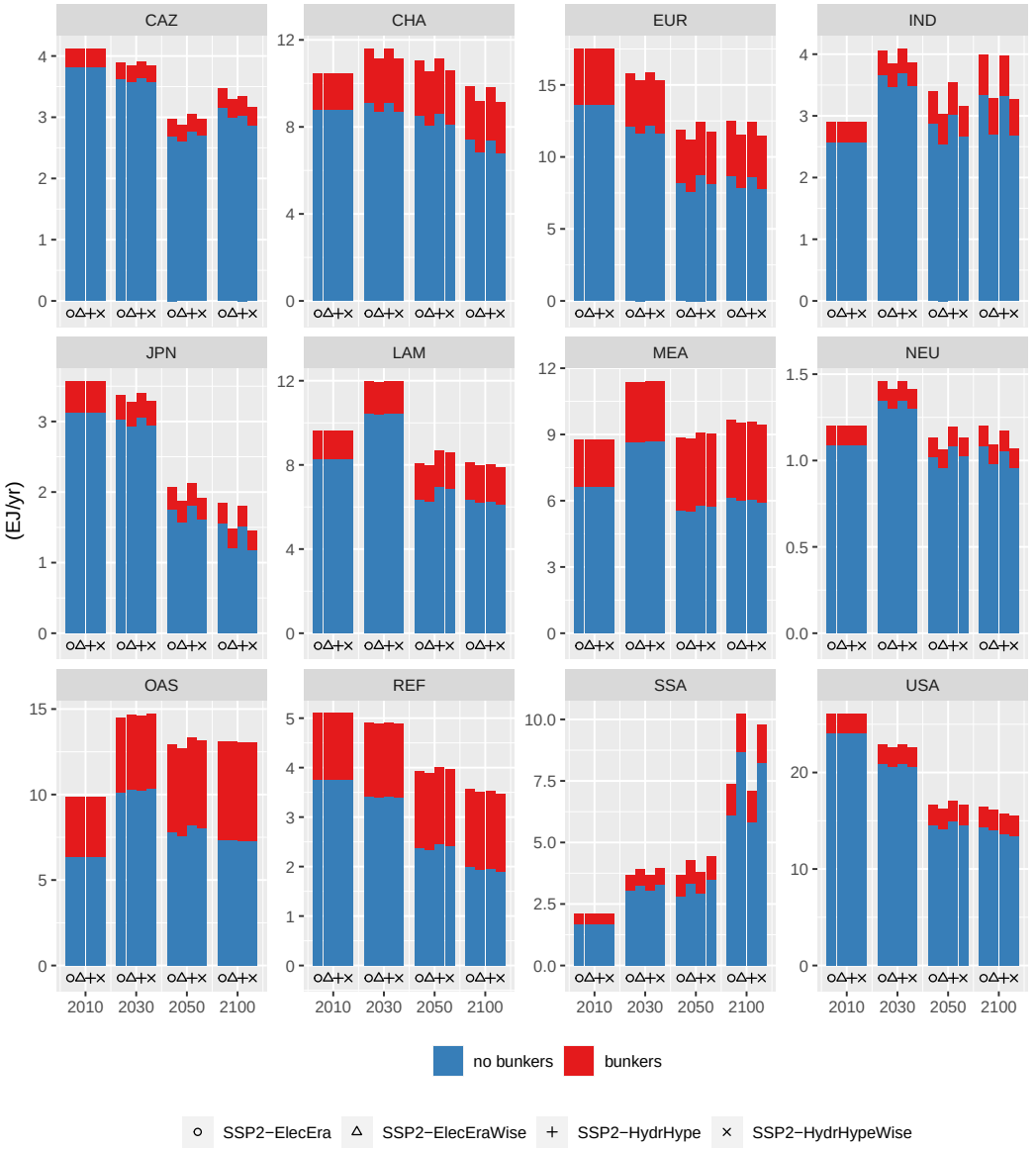


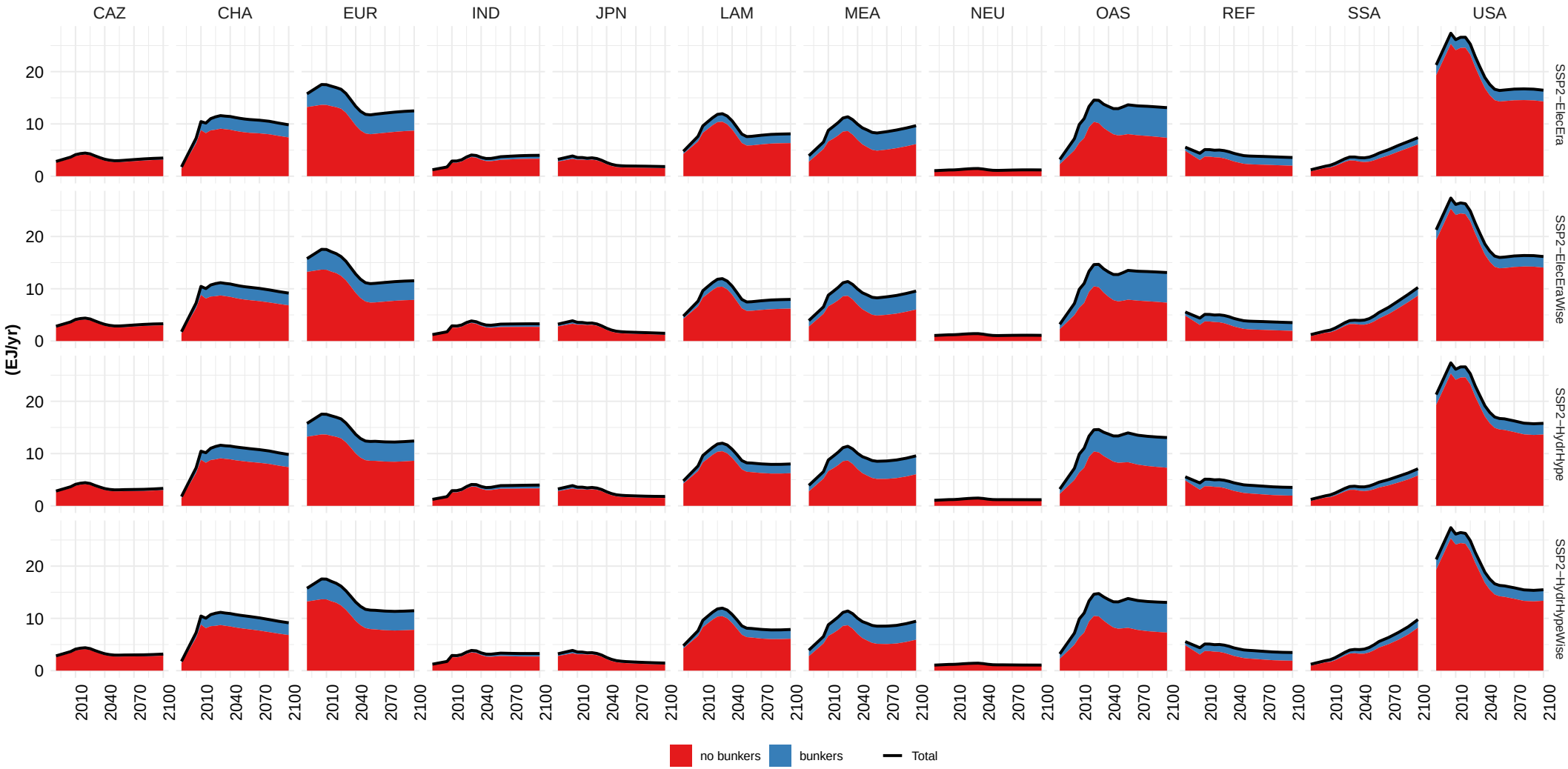

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
(EJ/yr)
0
10
20
2010
2040
2070
2100
Busses
Small Cars
Aircraft domestic
Ships domestic
Freight Trains
Passenger Trains
Aircraft international
Ships international
Large Cars
Motorbikes
Trucks
Total

1.3 Final energy bunkers vs. no bunkers



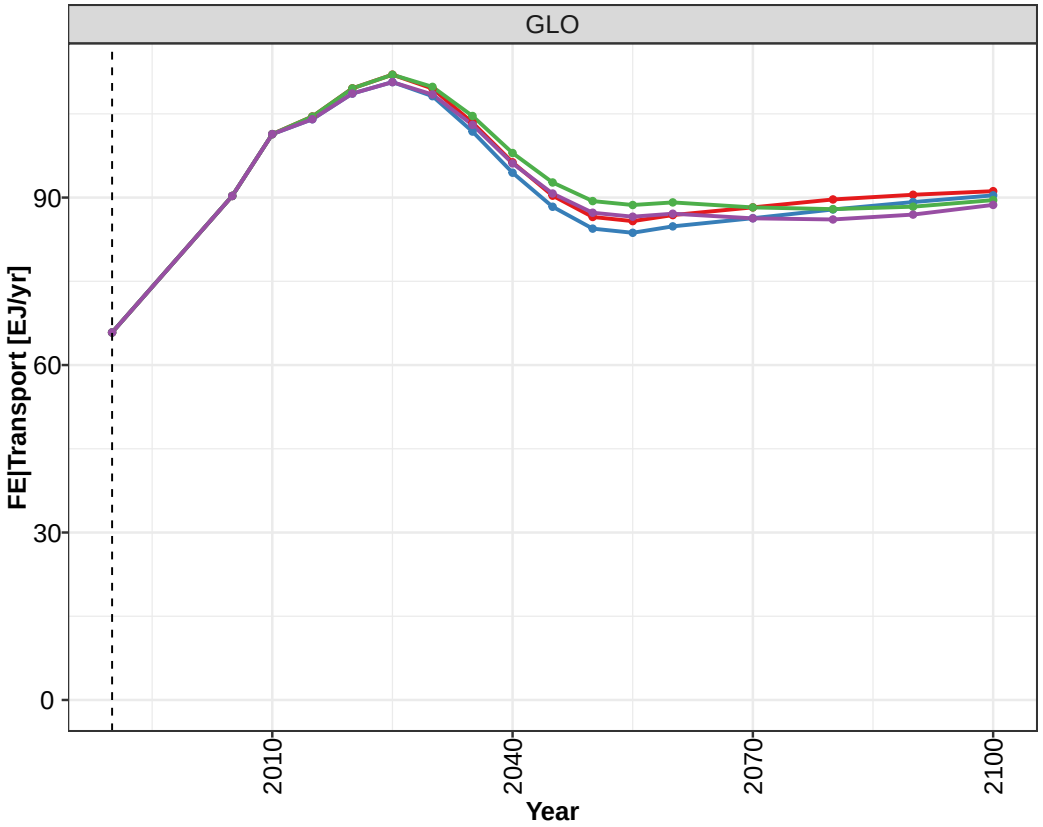


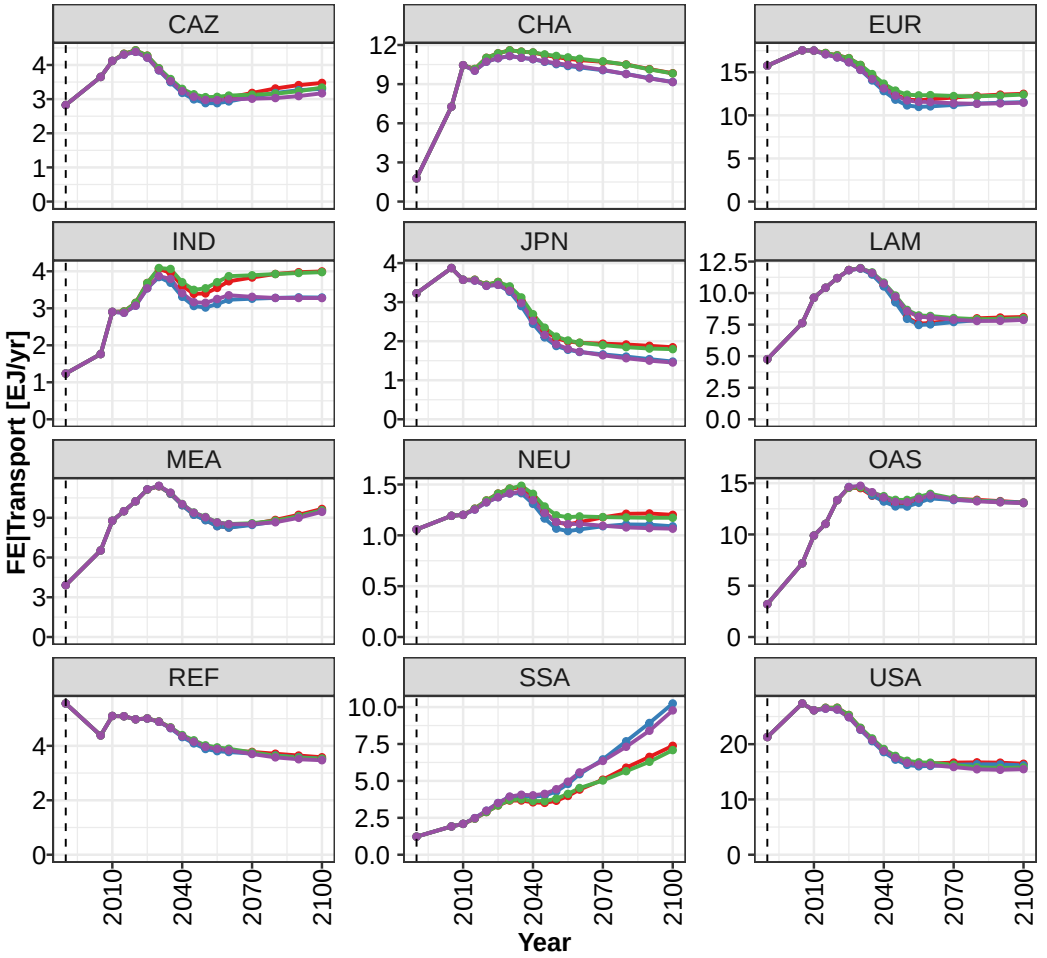


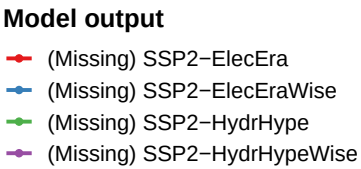

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
(EJ/yr)
0
10
20
2010
2040
2070
2100
no bunkers
bunkers
Total

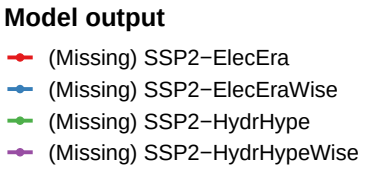
1.4 Final Energy line plots

1.4.1 Total

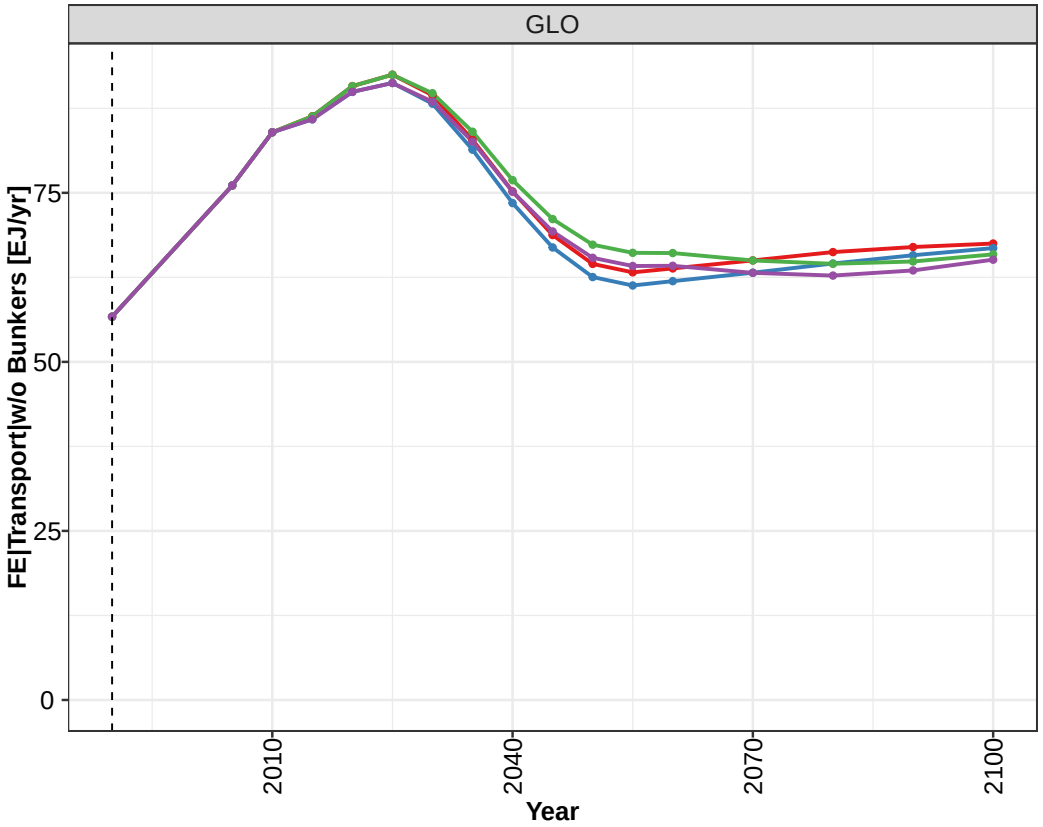


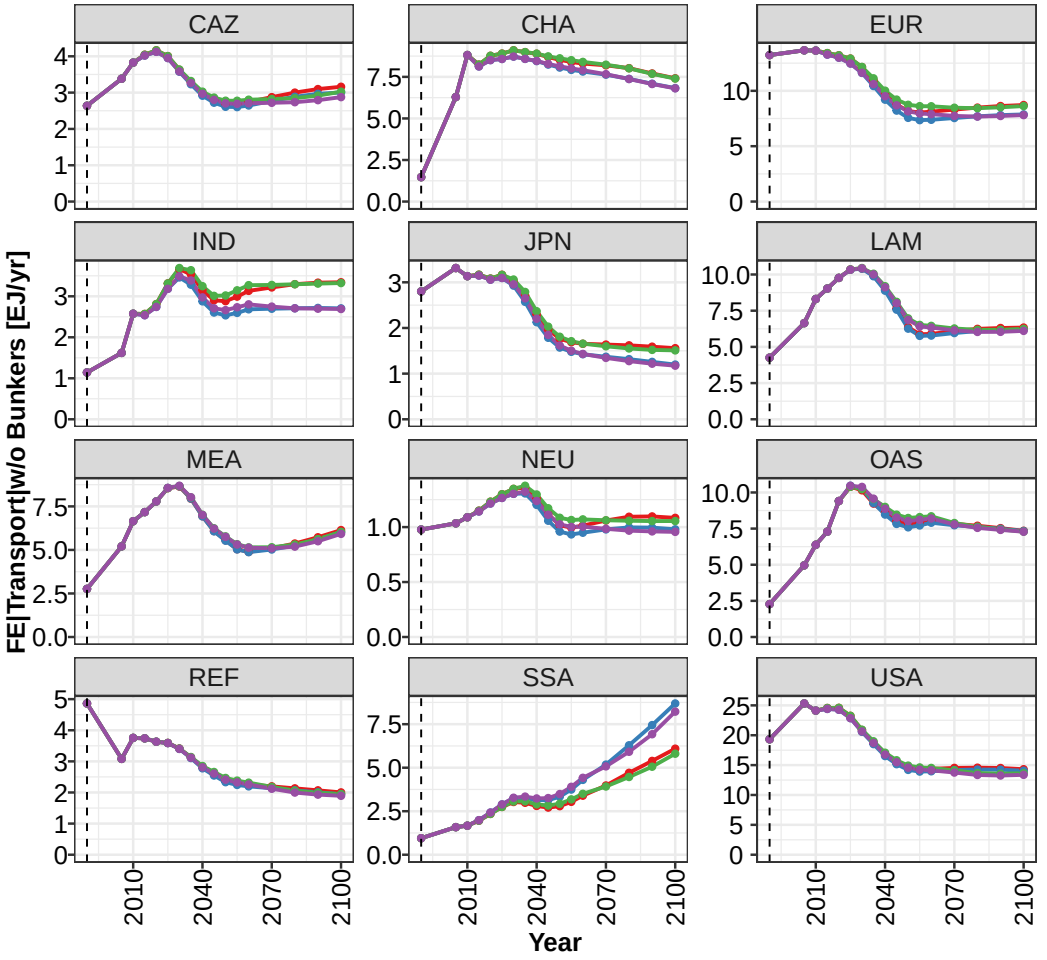


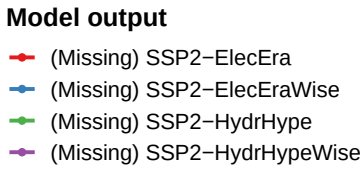


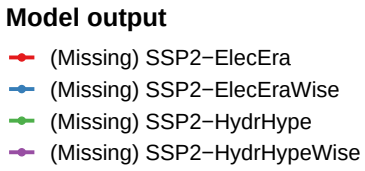


1.4.2 W/O Bunkers

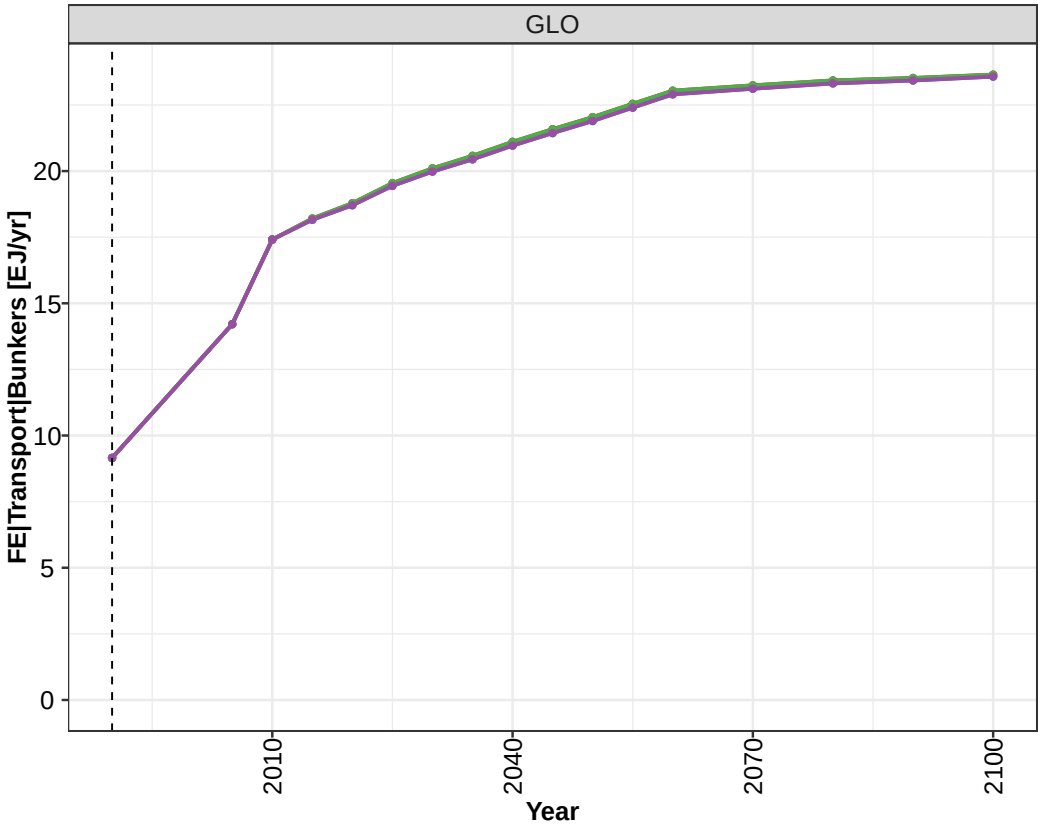


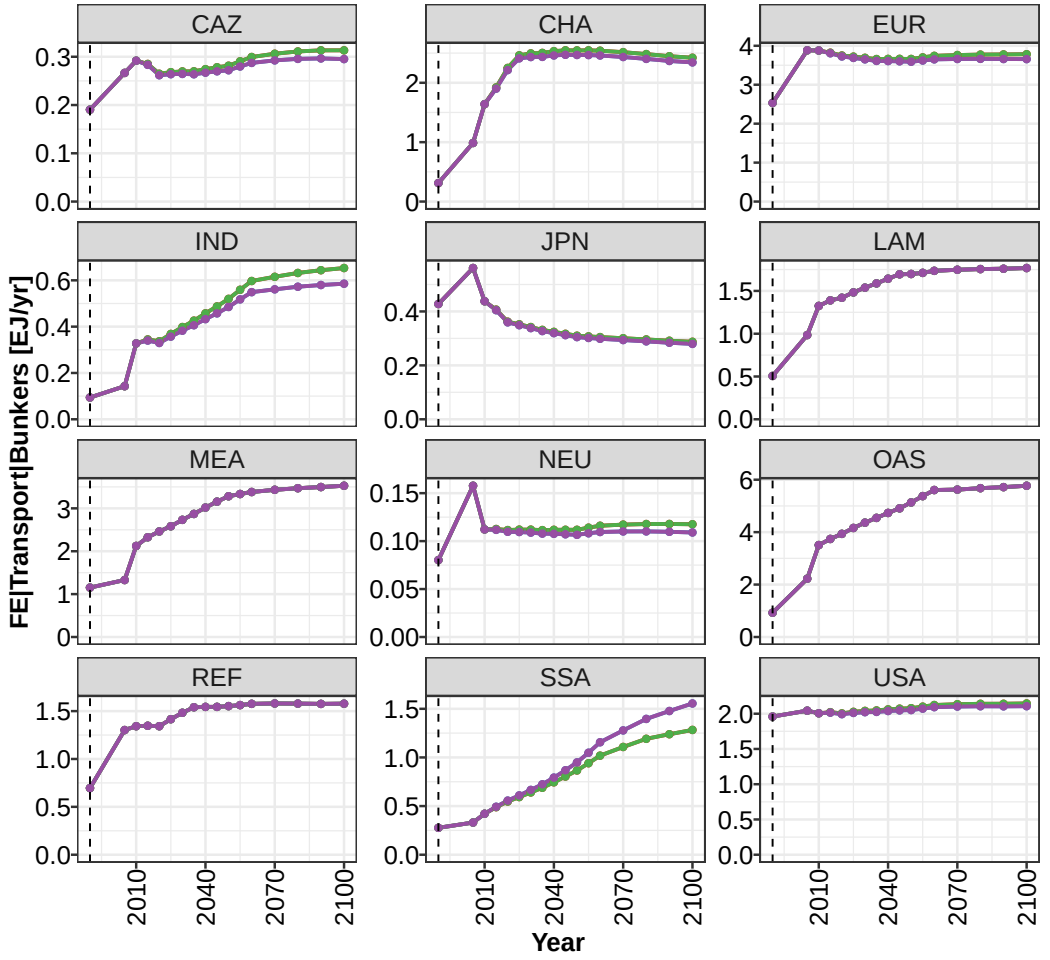


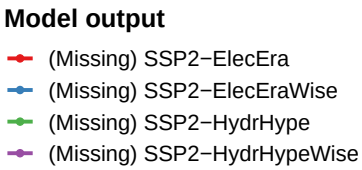


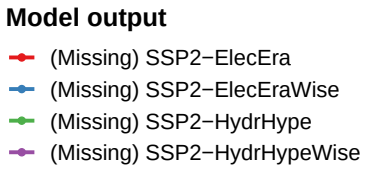


1.4.3 Bunkers


GLO
FE|Transport|Bunkers [EJ/yr]
0
5
10
15
20
2010
2040
2070
2100
Year

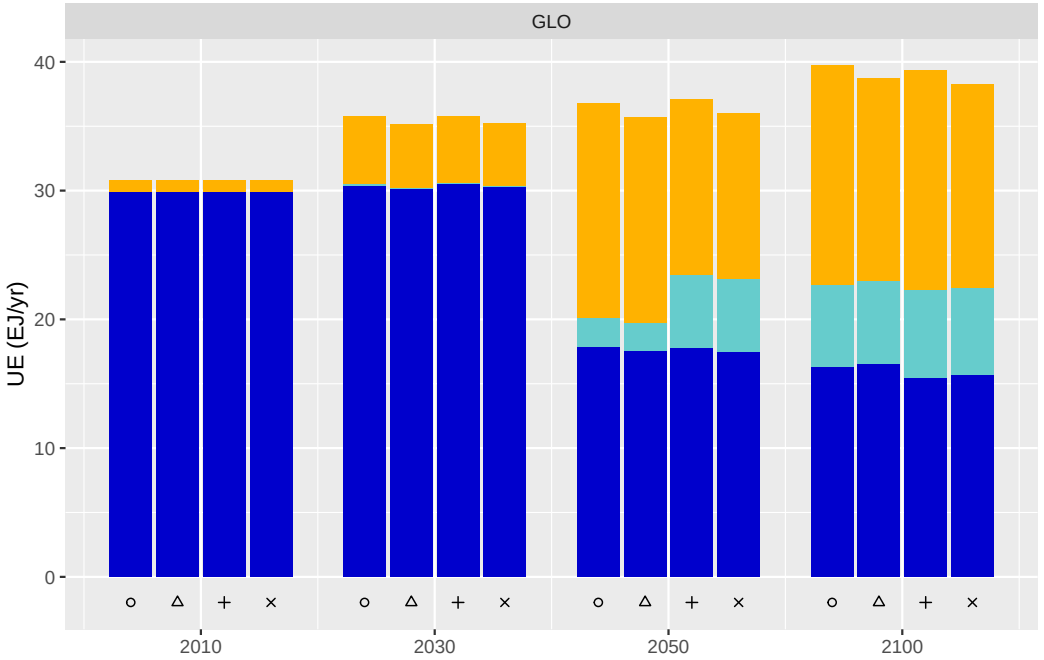

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
FE|Transport|Bunkers [EJ/yr]
2010
2040
2070
2100
Year

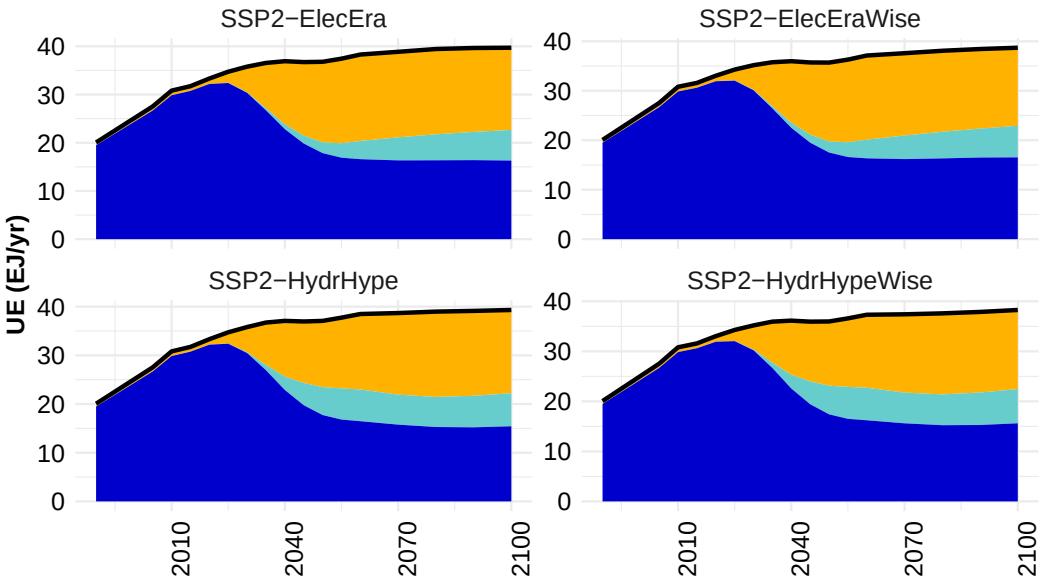

Model output
(Missing) SSP2−ElecEra
(Missing) SSP2−ElecEraWise
(Missing) SSP2−HydrHype
(Missing) SSP2−HydrHypeWise

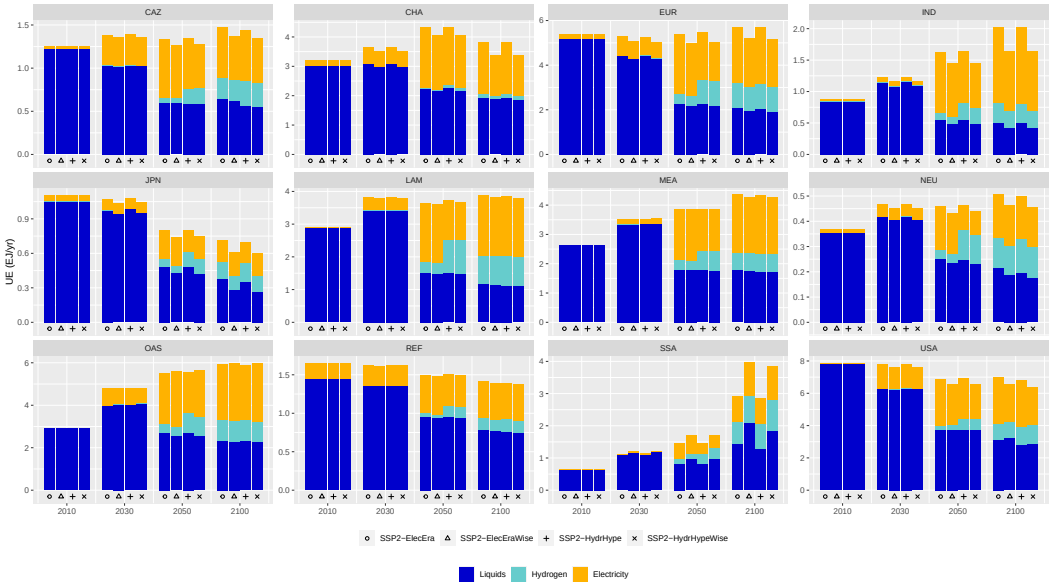

Model output
(Missing) SSP2−ElecEra
(Missing) SSP2−ElecEraWise
(Missing) SSP2−HydrHype
(Missing) SSP2−HydrHypeWise

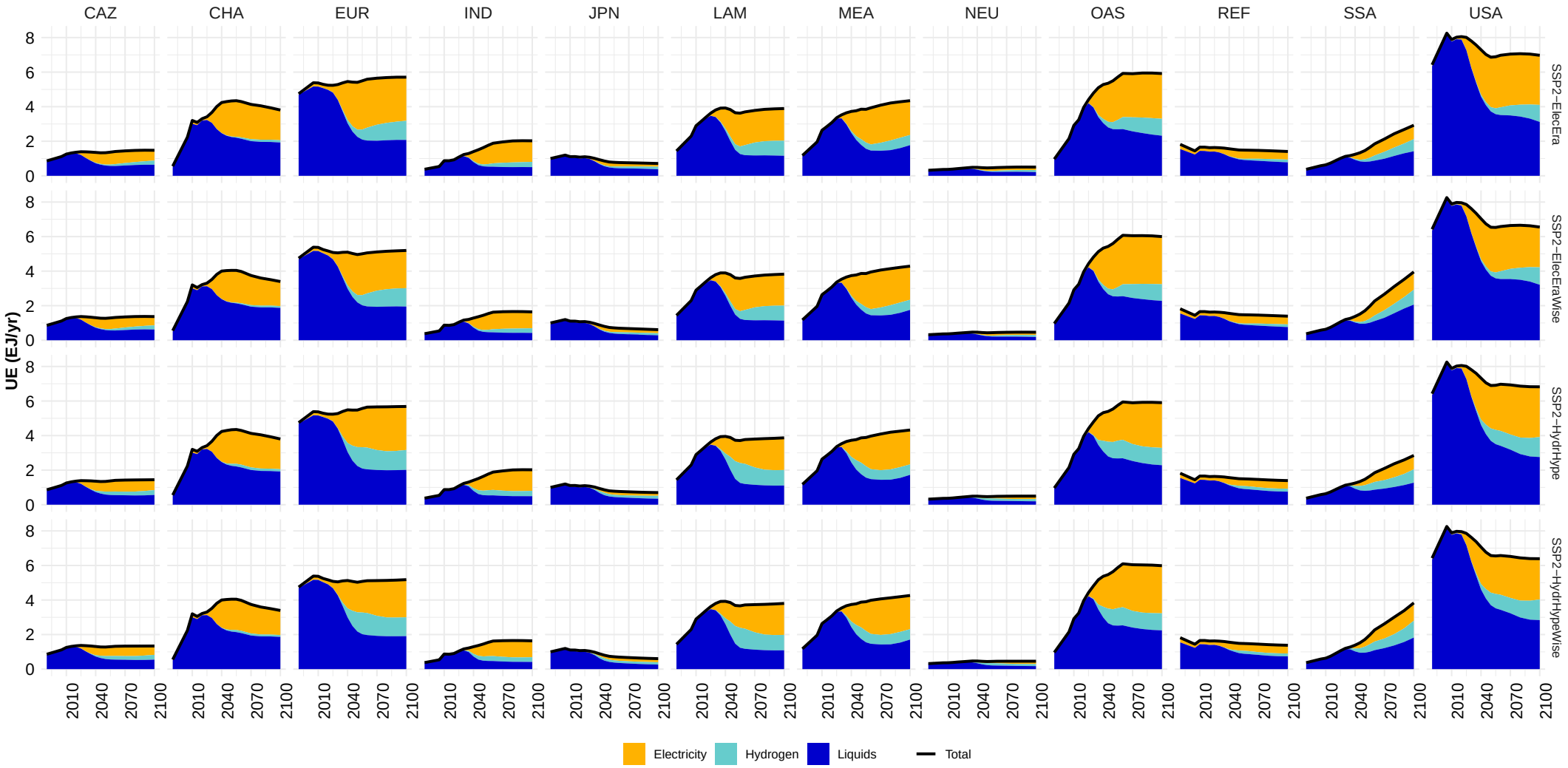
1.5 Useful energy by carrier

1.5.1 Total

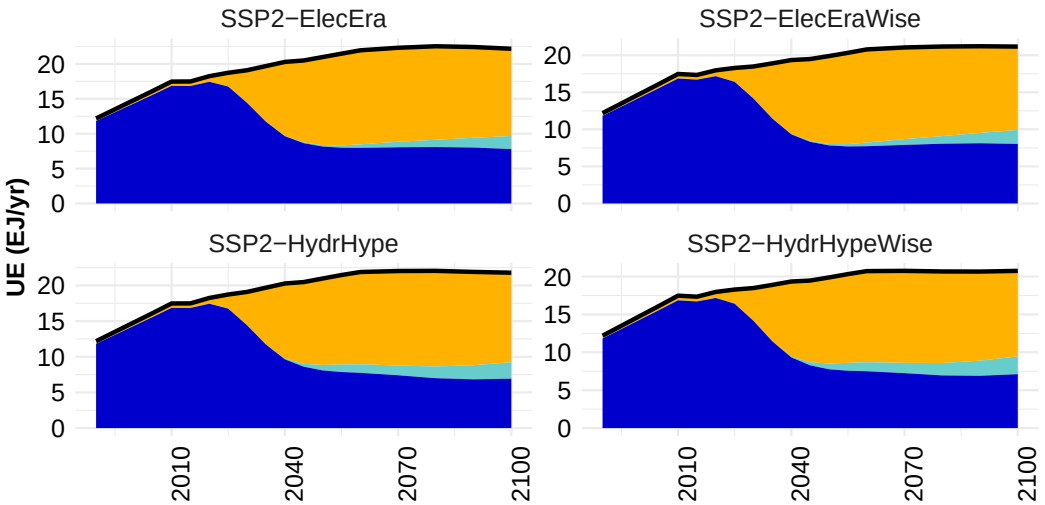


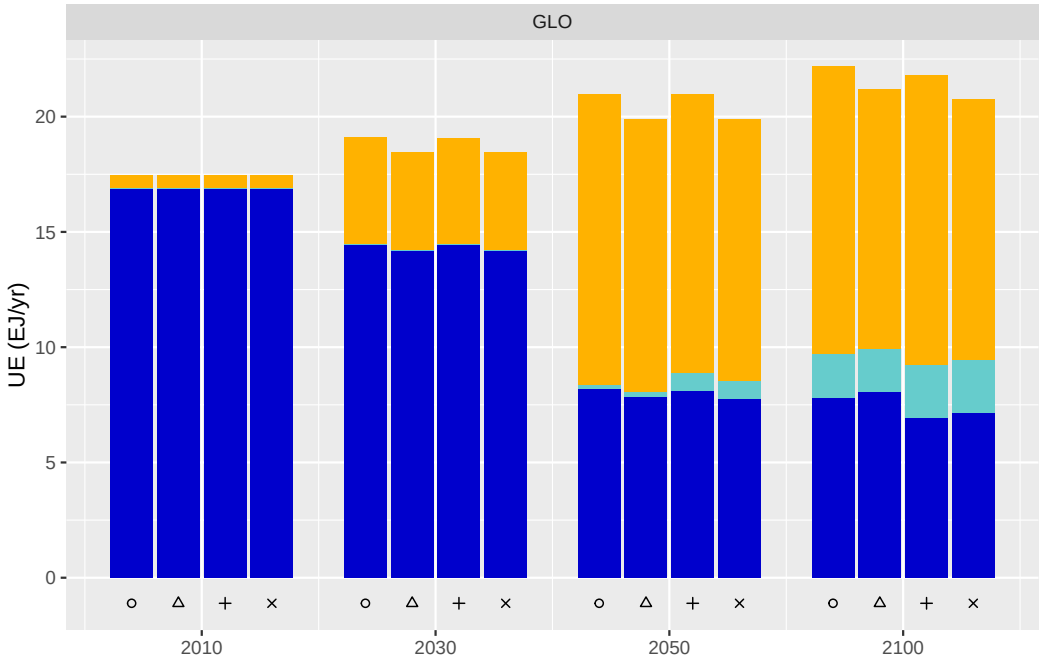


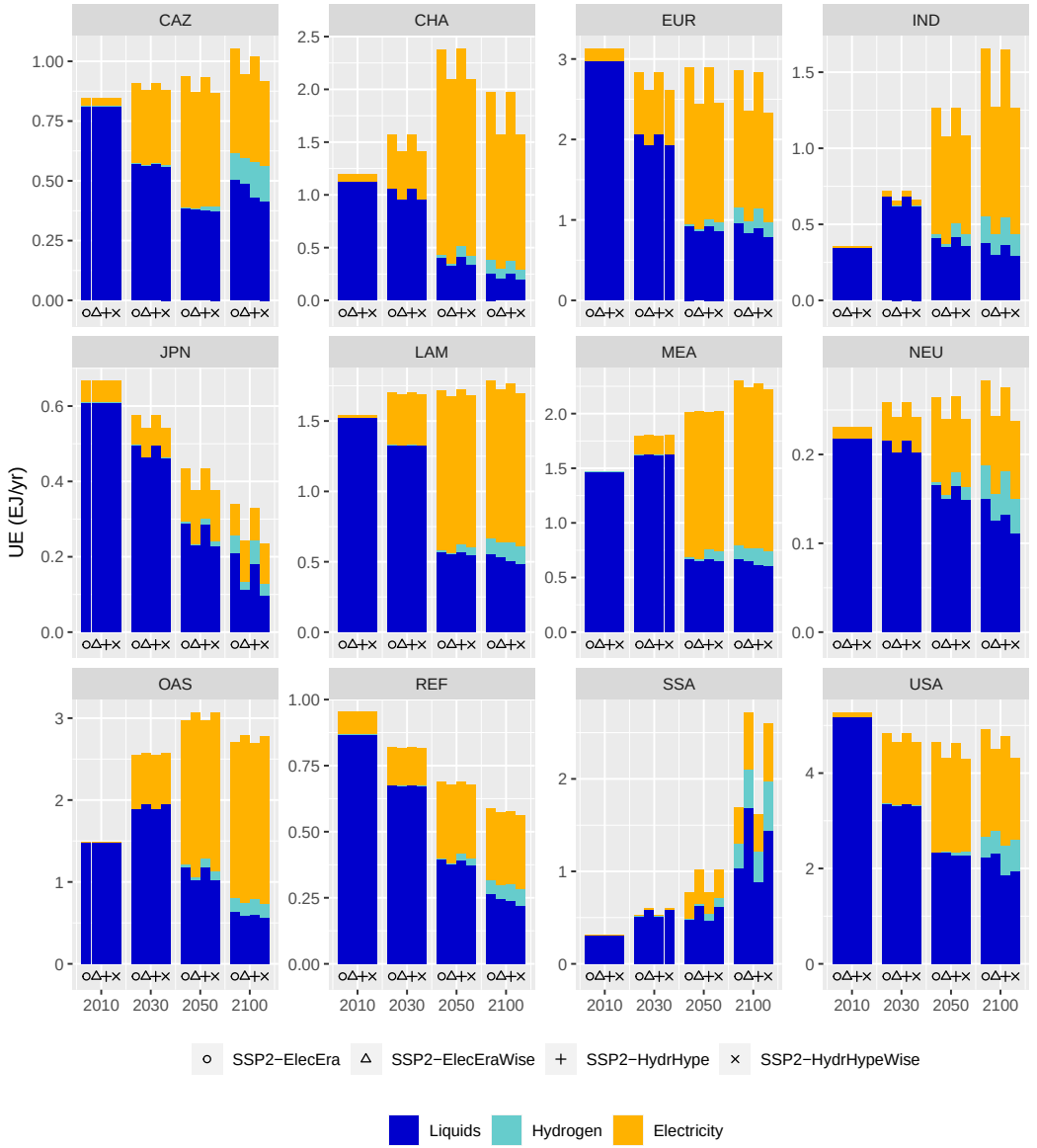


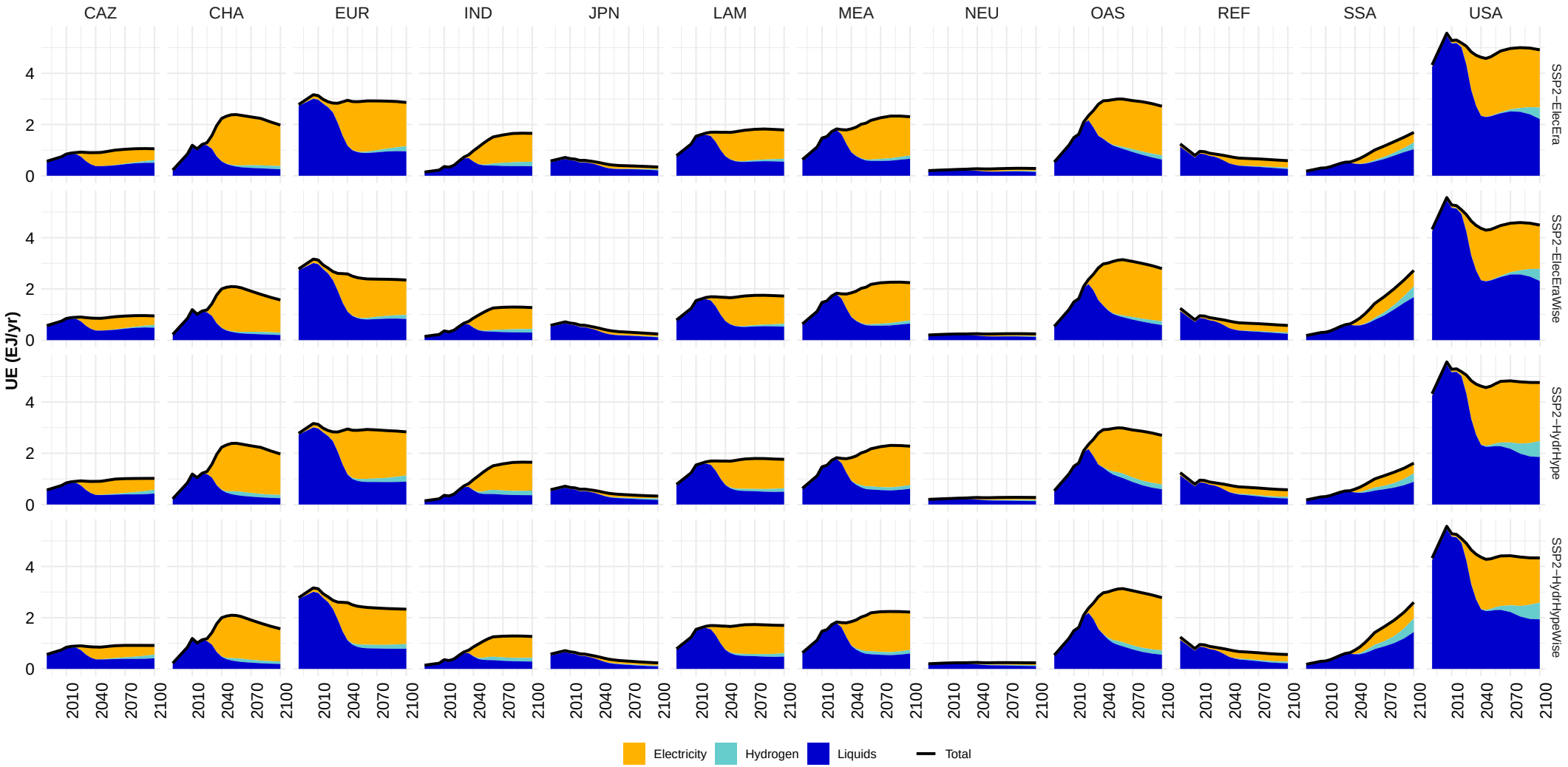

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
UE (EJ/yr)
0
2
4
6
8
2010
2040
2070
2100
Electricity
Hydrogen
Liquids
Total

1.5.2 Passenger

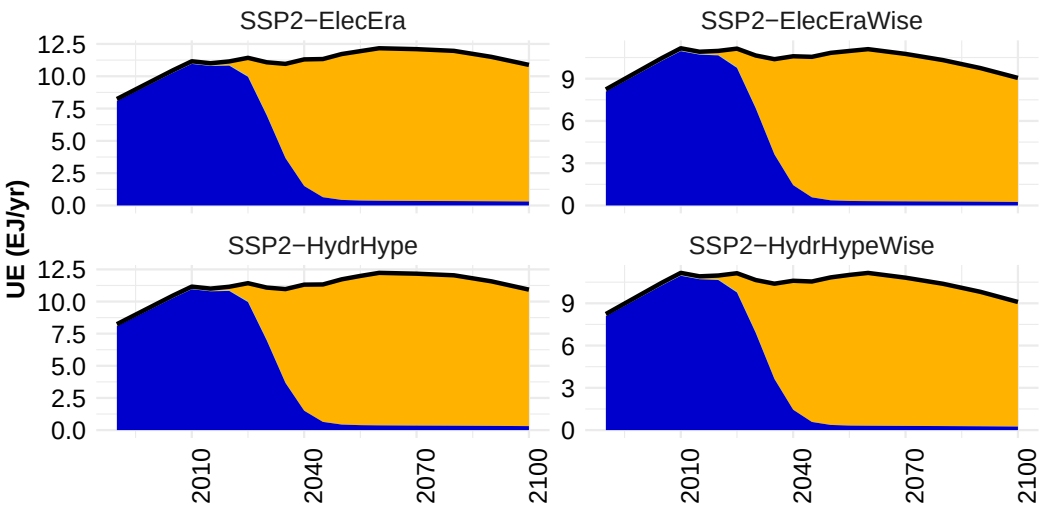


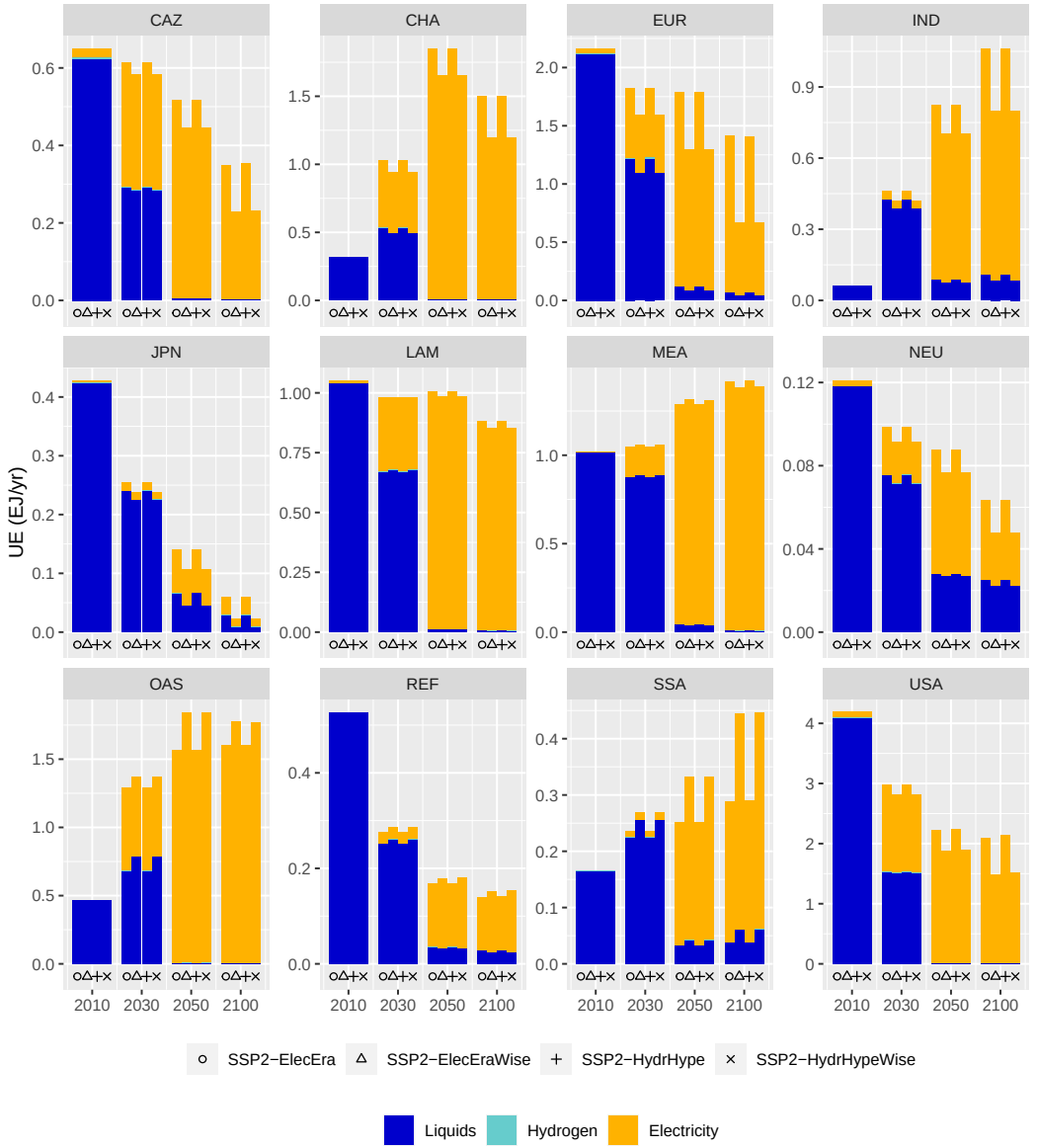


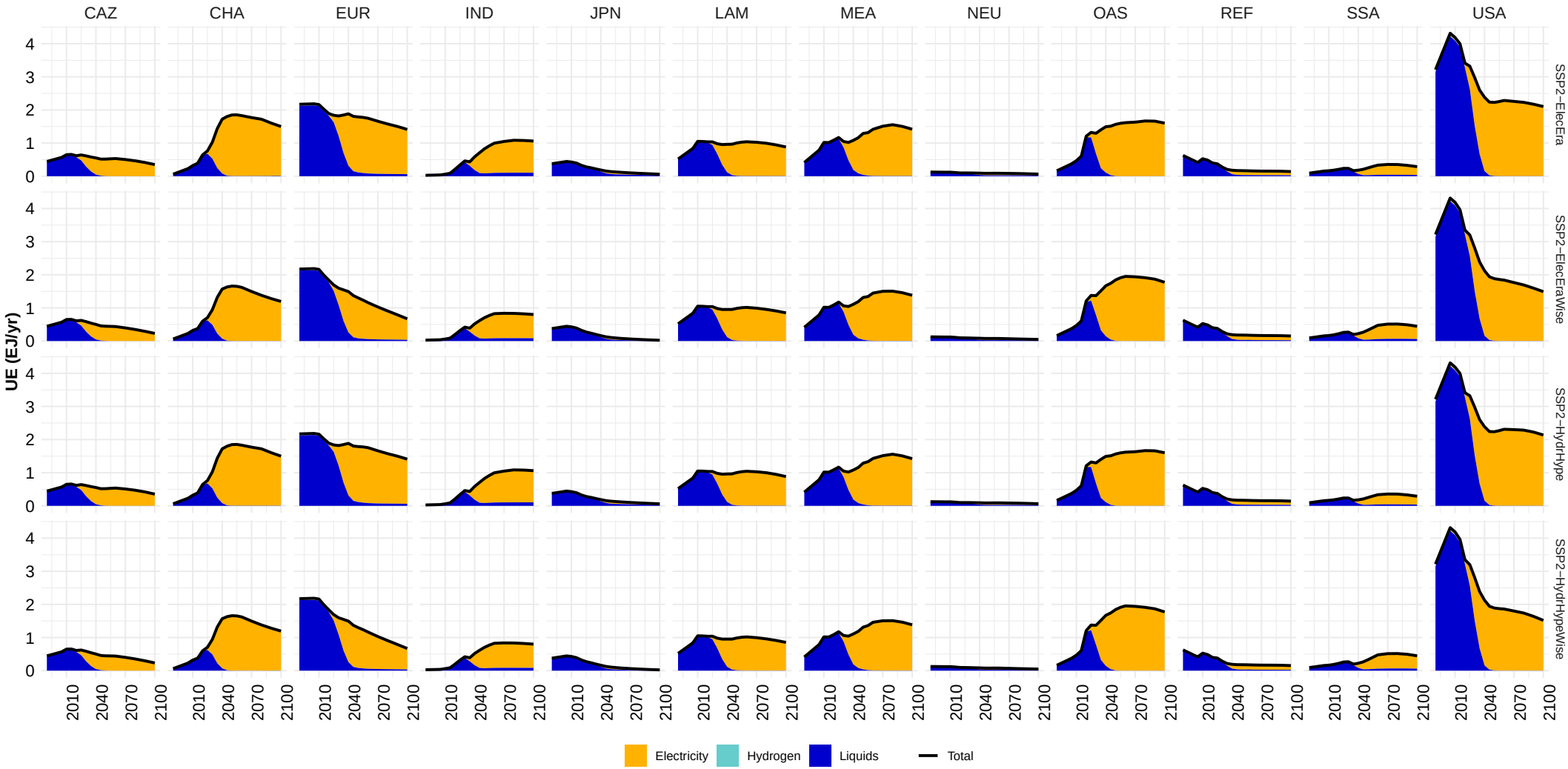



CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
UE (EJ/yr)
0
2
4
2010
2040
2070
2100
Electricity
Hydrogen
Liquids
Total

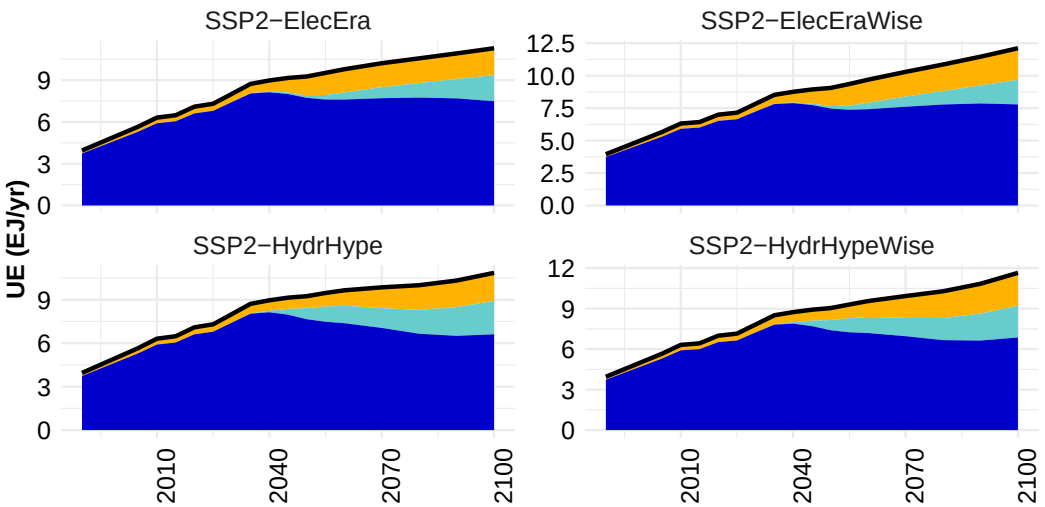
1.5.3 Passenger LDV

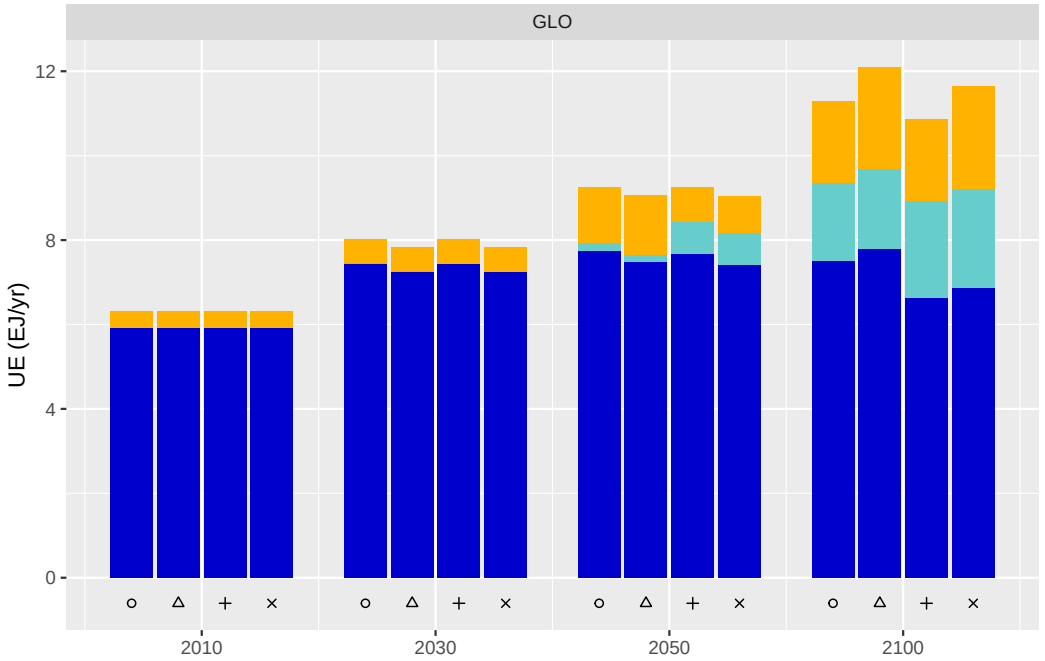


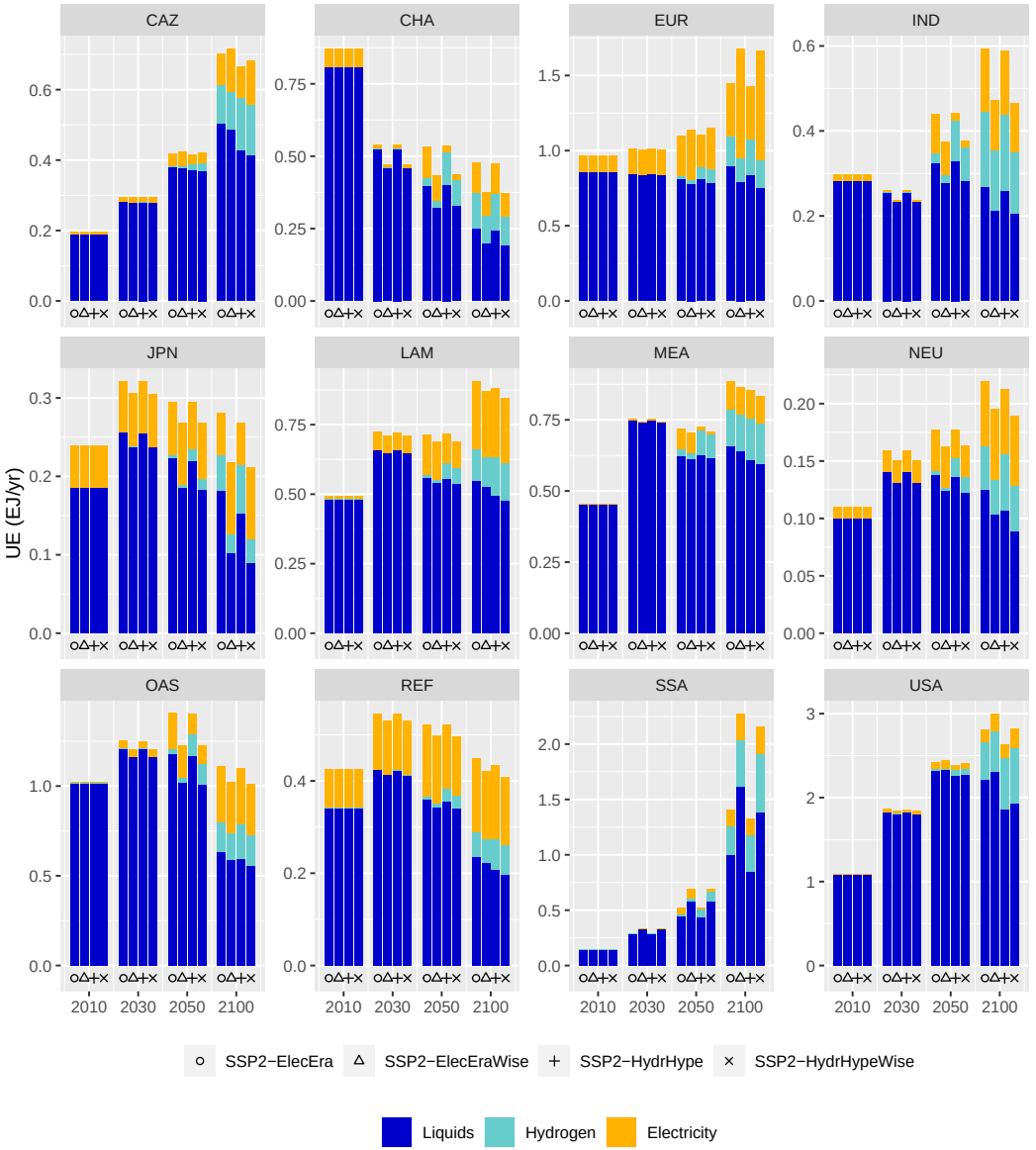


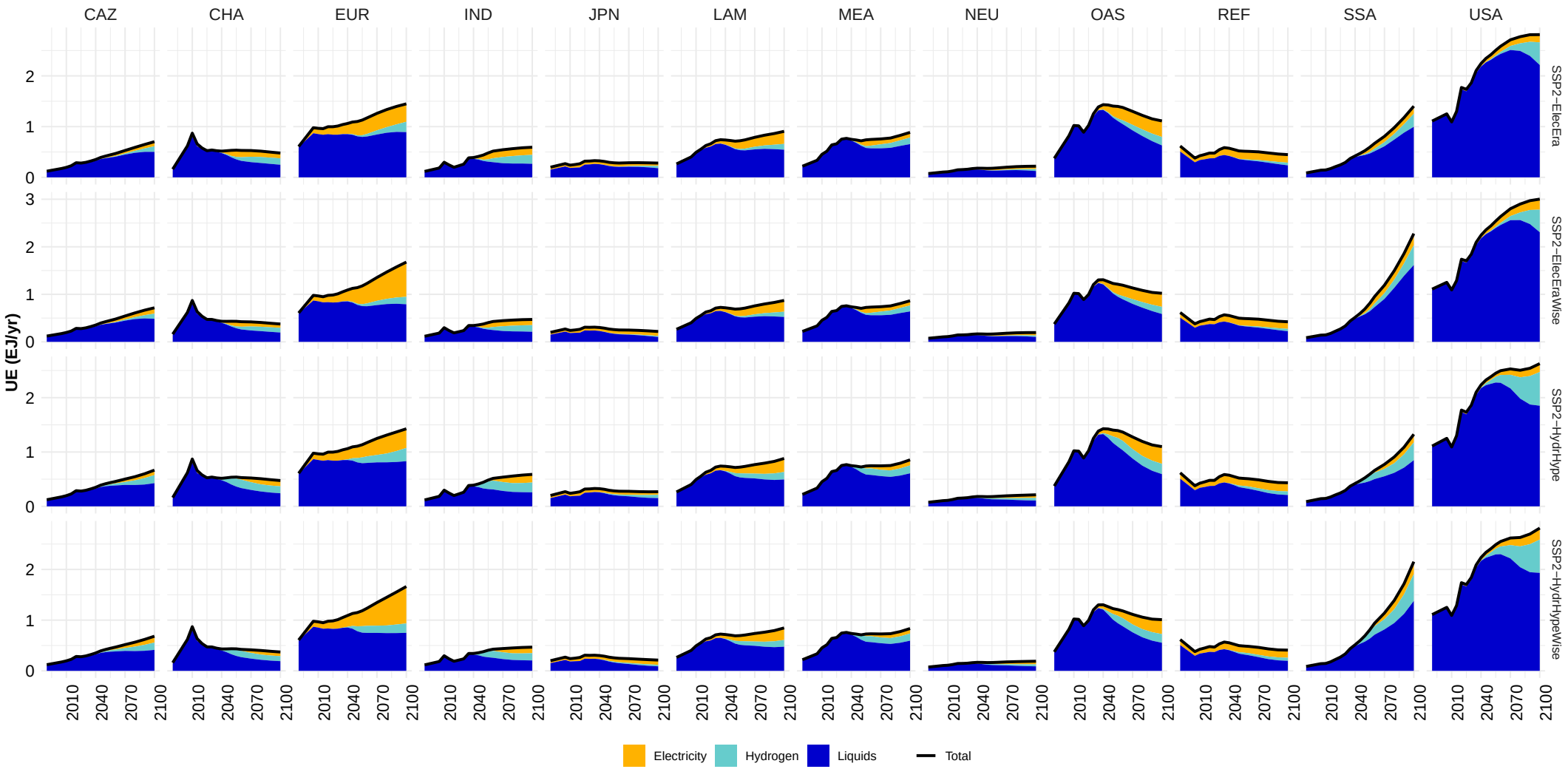

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
UE (EJ/yr)
0
1
2
3
4
2010
2040
2070
2100
Electricity
Hydrogen
Liquids
Total

1.5.4 Passenger non-LDV

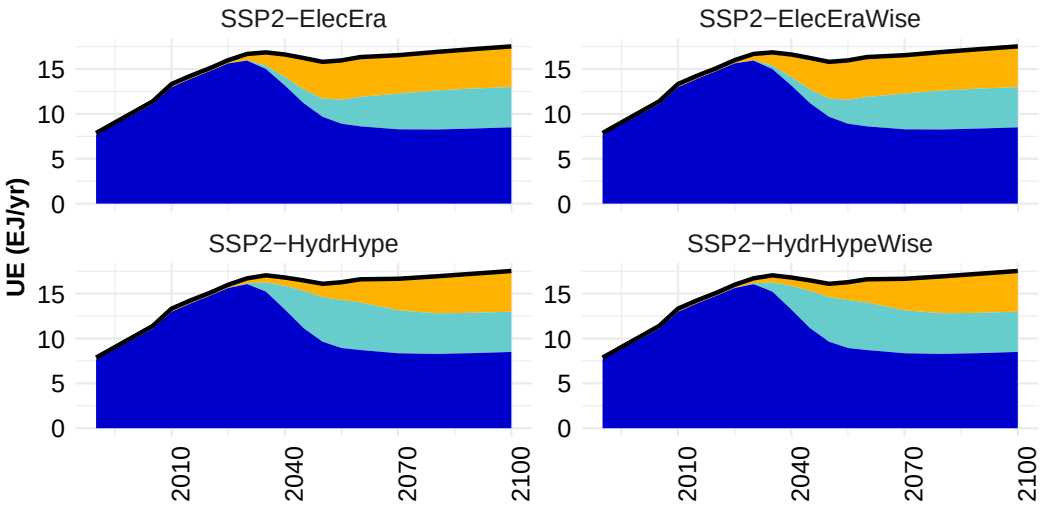


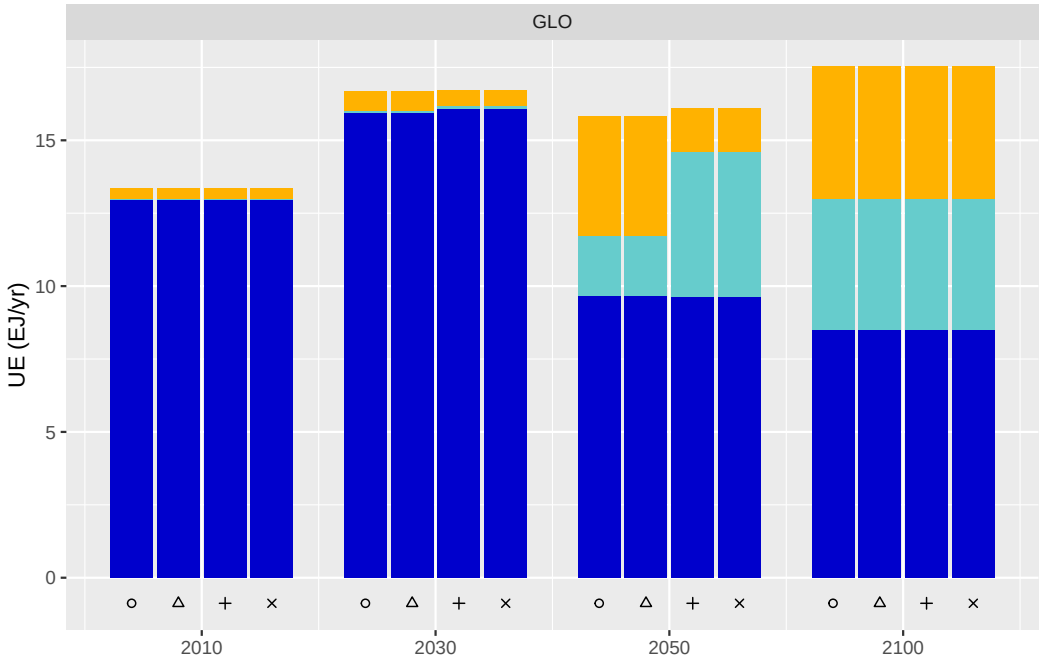


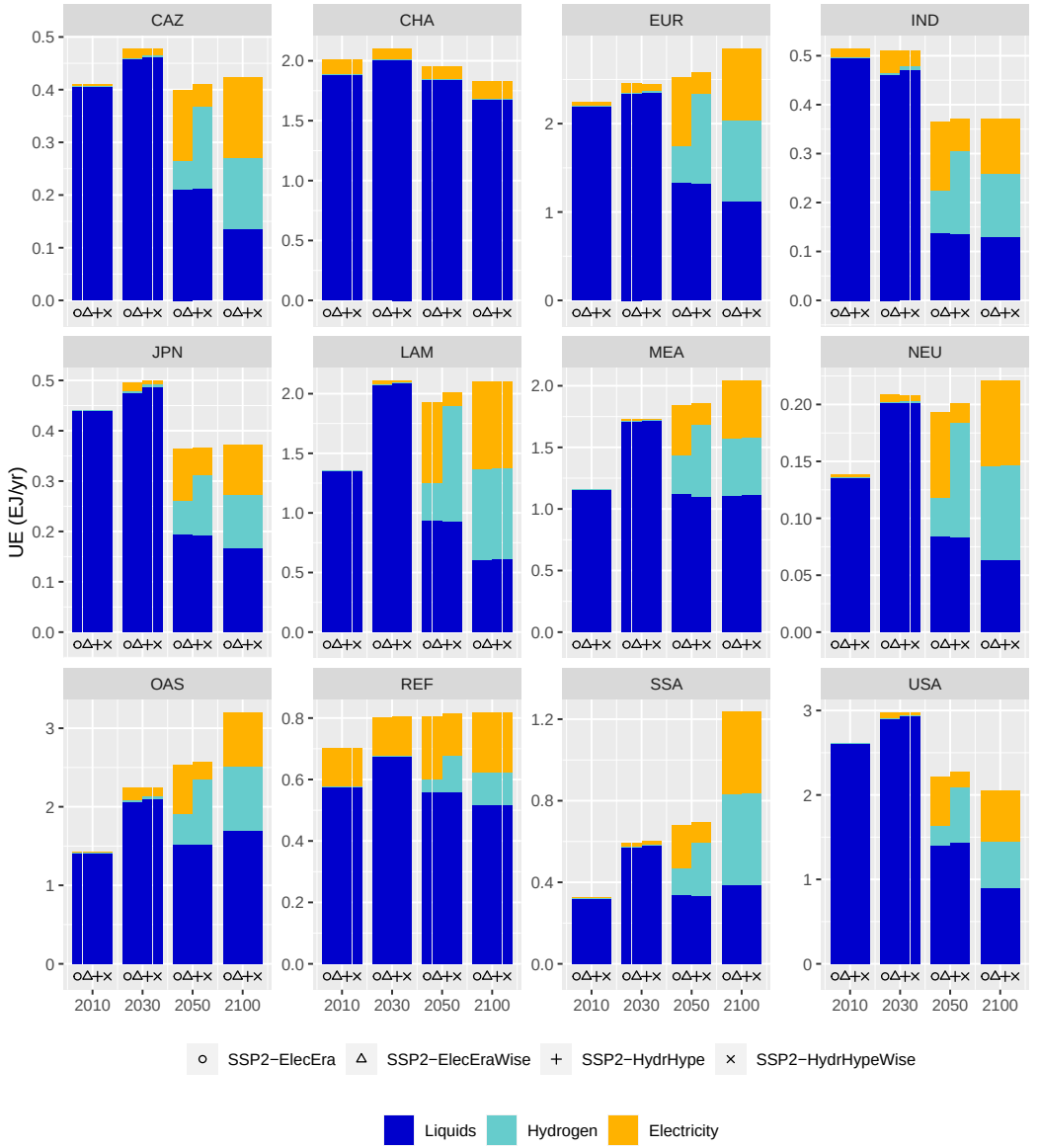


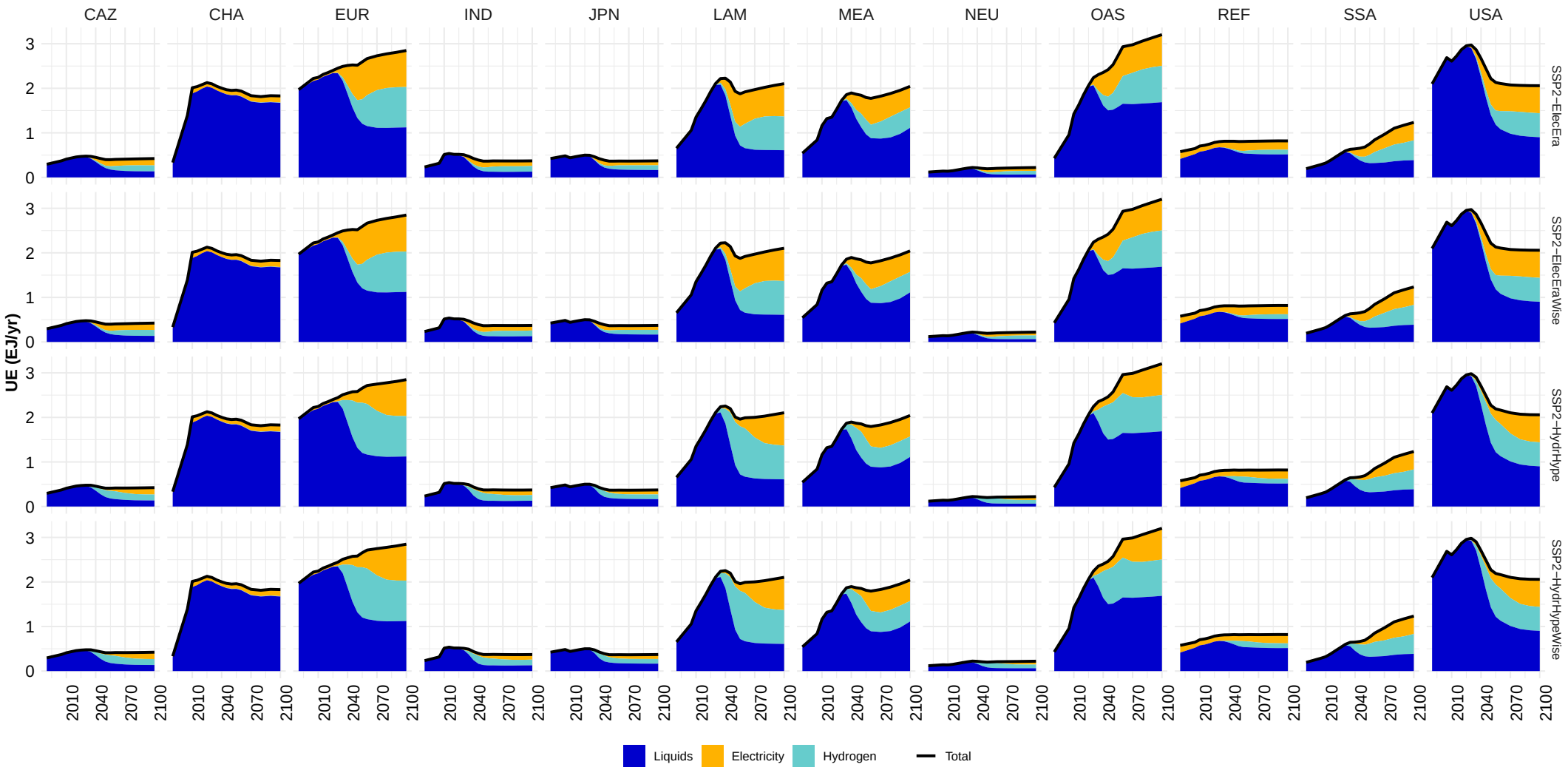

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
UE (EJ/yr)
0
1
2
3
2010
2040
2070
2100
Electricity
Hydrogen
Liquids
Total

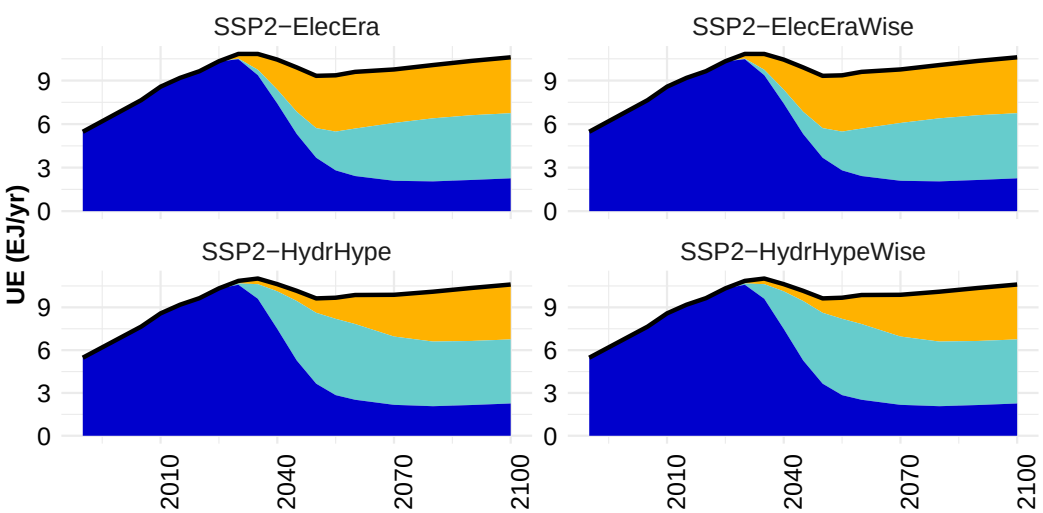
1.5.5 Freight


SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
UE (EJ/yr)
0
5
10
15
2010
2040
2070
2100

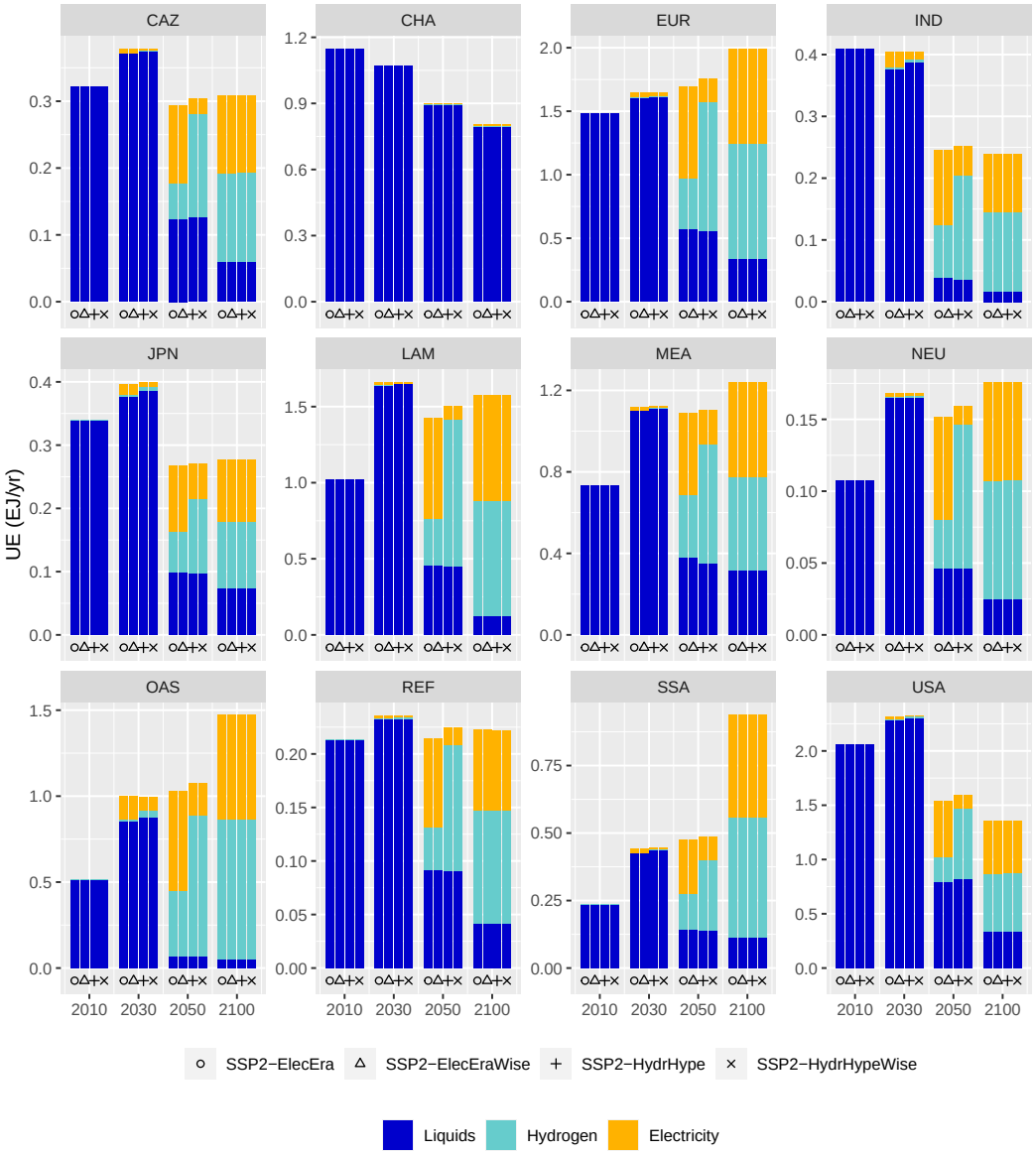

GLO
UE (EJ/yr)
0
5
10
15
2010
2030
2050
2100

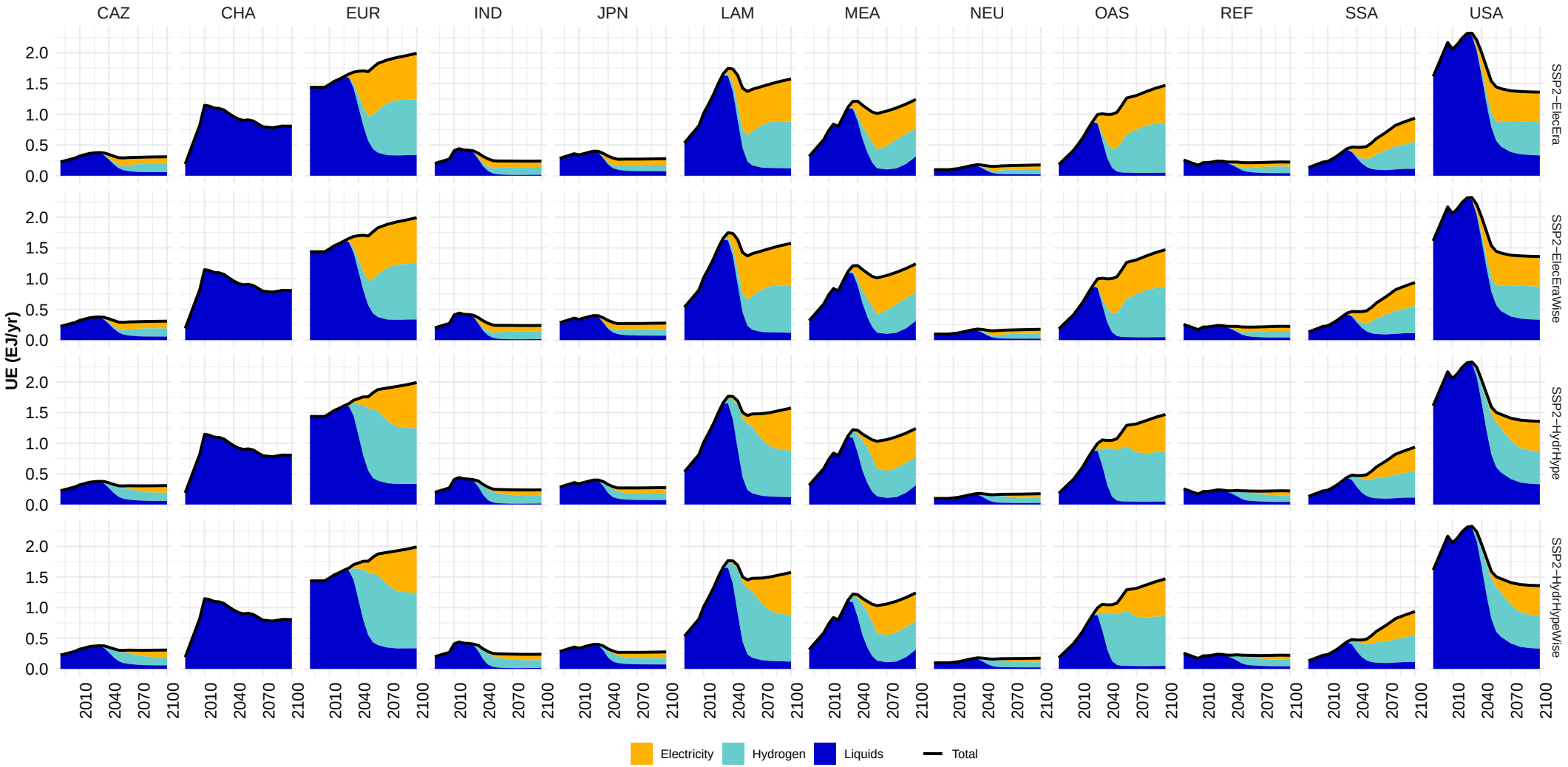

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
UE (EJ/yr)
2010
2030
2050
2100
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
Liquids
Hydrogen
Electricity


CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
UE (EJ/yr)
0
1
2
3
2010
2040
2070
2100
Liquids
Electricity
Hydrogen
Total


SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
UE (EJ/yr)
0
3
6
9
2010
2040
2070
2100

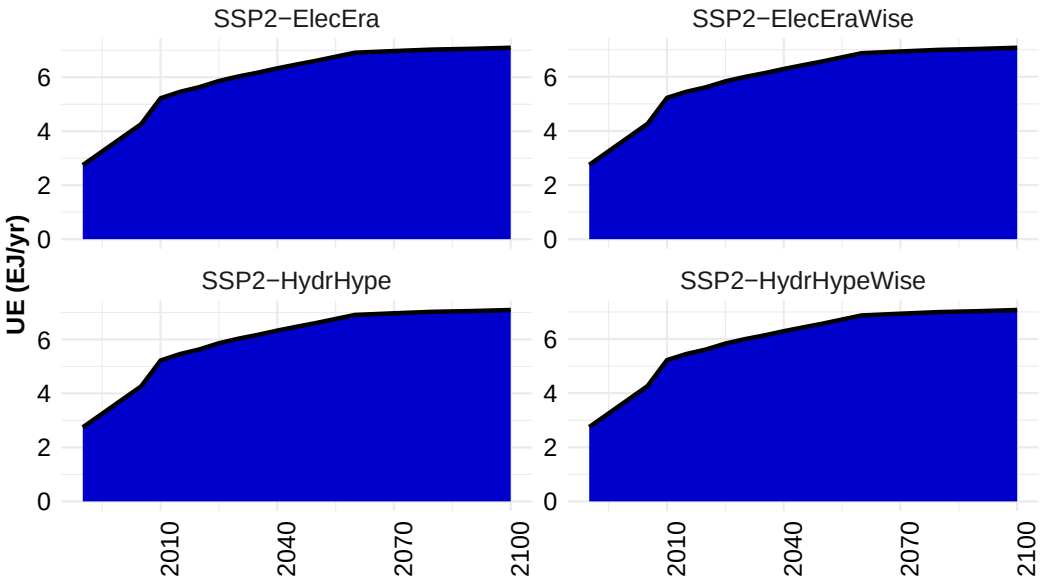
GLO
UE (EJ/yr)
0
3
6
9
2010
2030
2050
2100

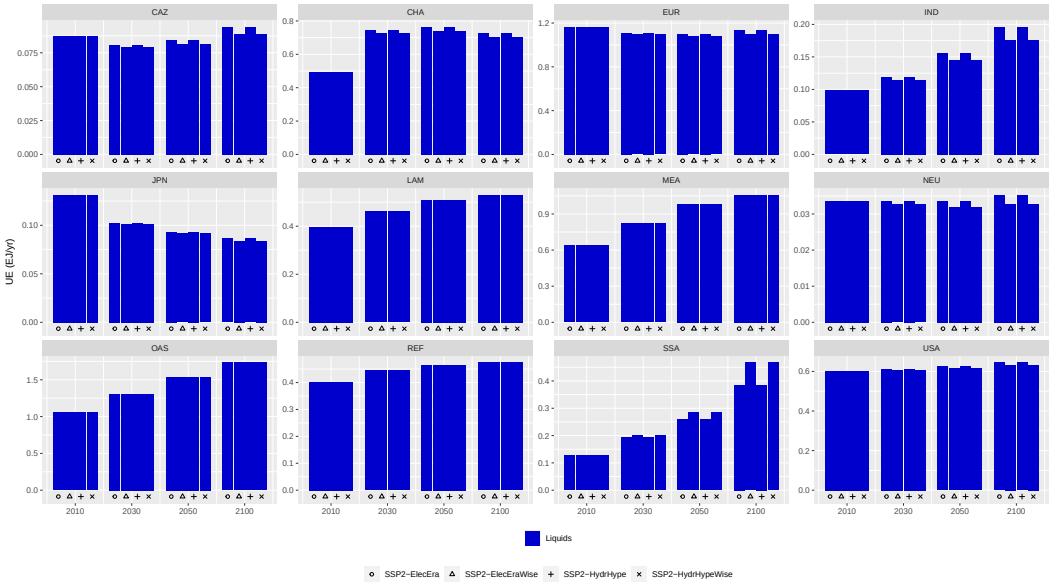

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
UE (EJ/yr)
2010
2030
2050
2100
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
Liquids
Hydrogen
Electricity

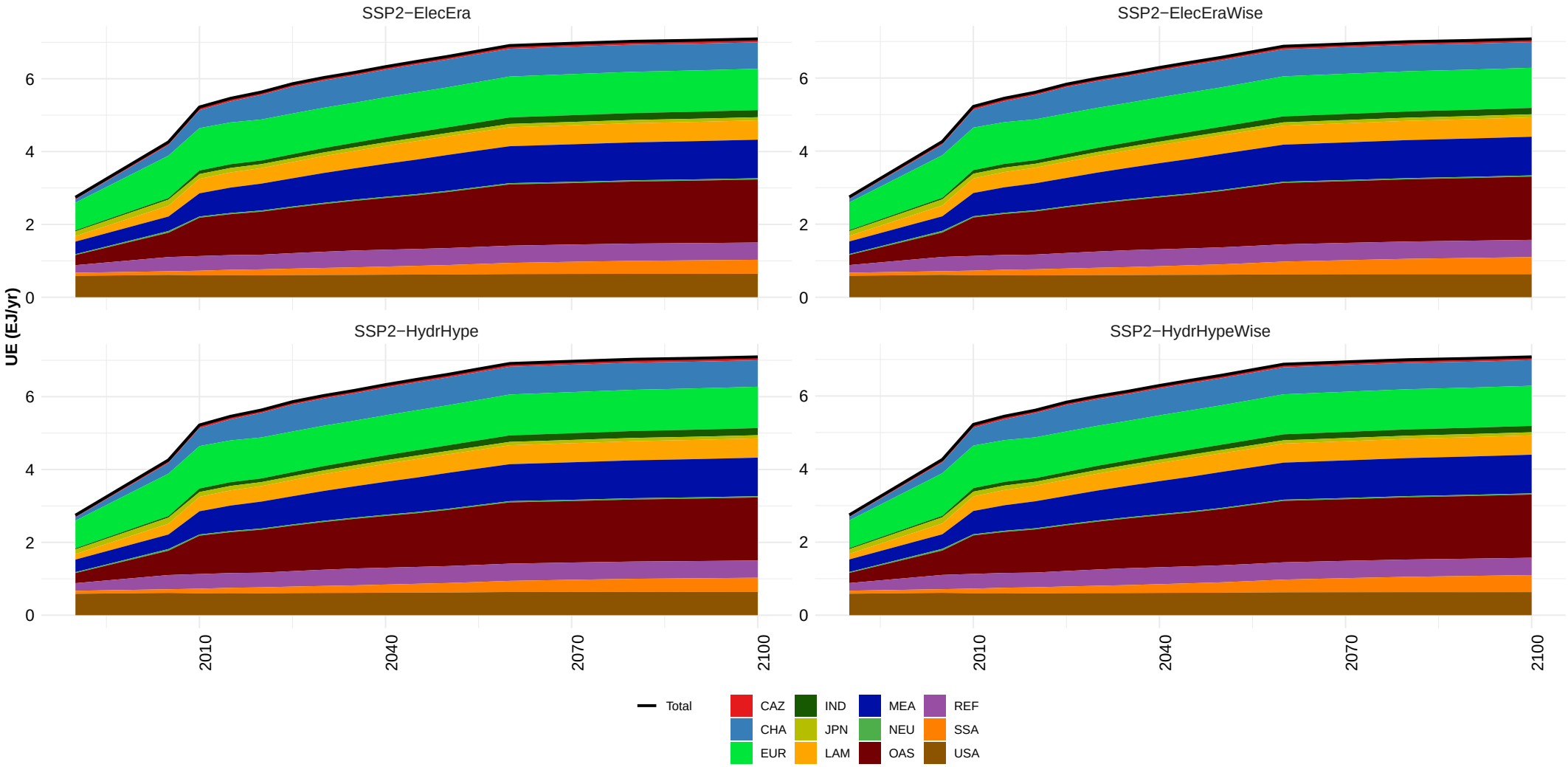

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
UE (EJ/yr)
0.0
0.5
1.0
1.5
2.0
2010
2040
2070
2100
Electricity
Hydrogen
Liquids
Total

1.5.6 Bunkers

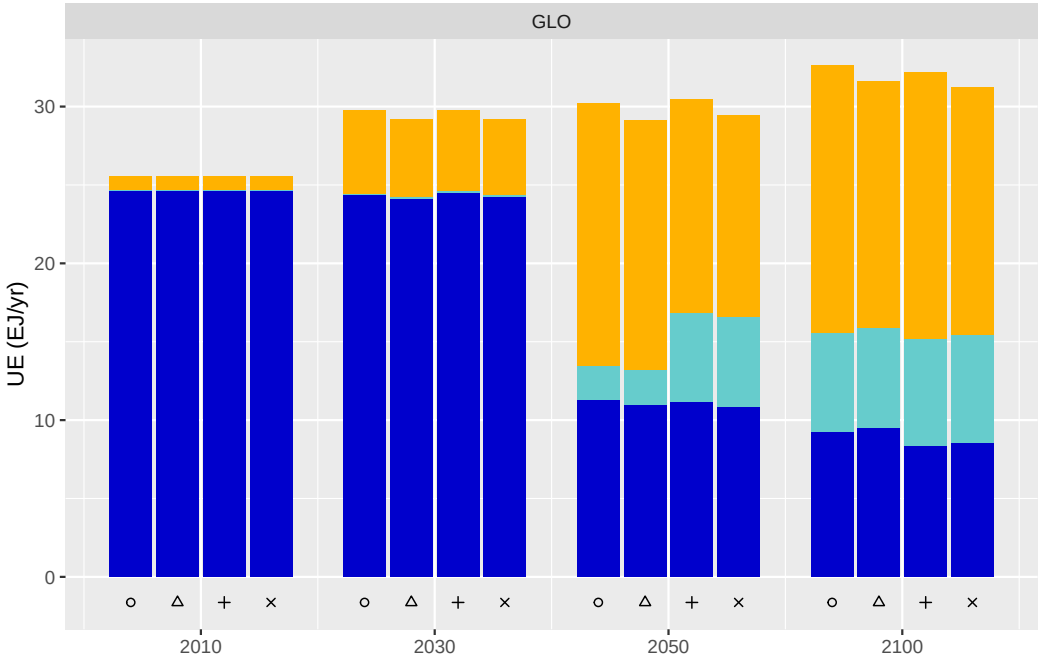
GLO
UE (EJ/yr)
0
2
4
6
2010
2030
2050
2100

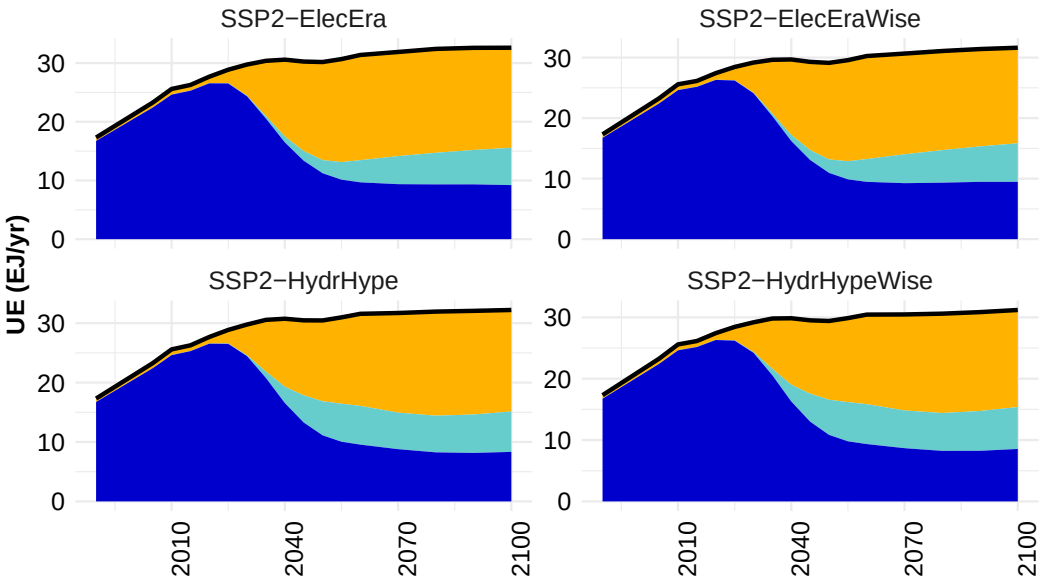

SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
UE (EJ/yr)
0
2
4
6
2010
2040
2070
2100

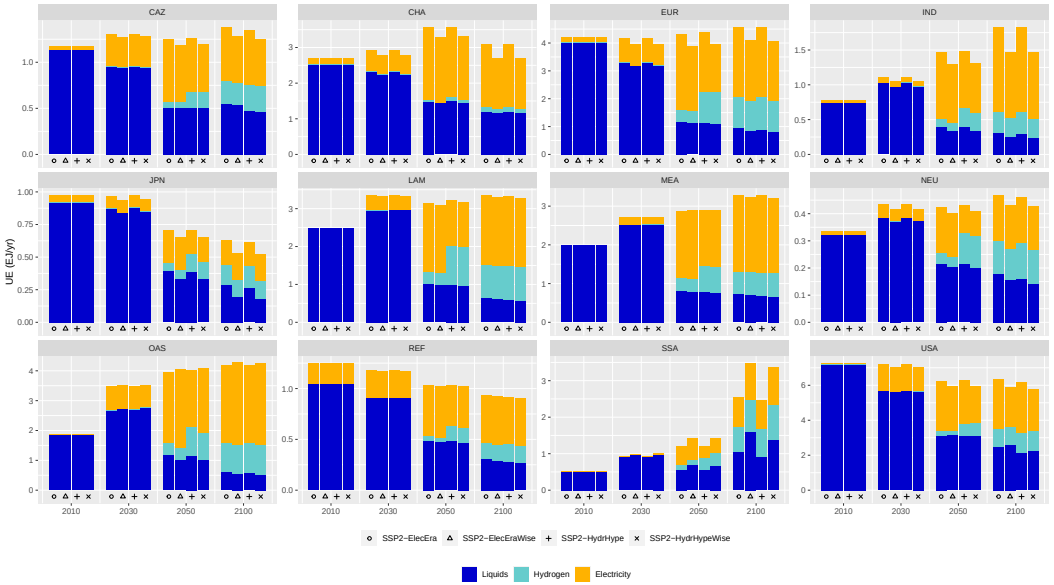

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
UE (EJ/yr)
Liquids
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise

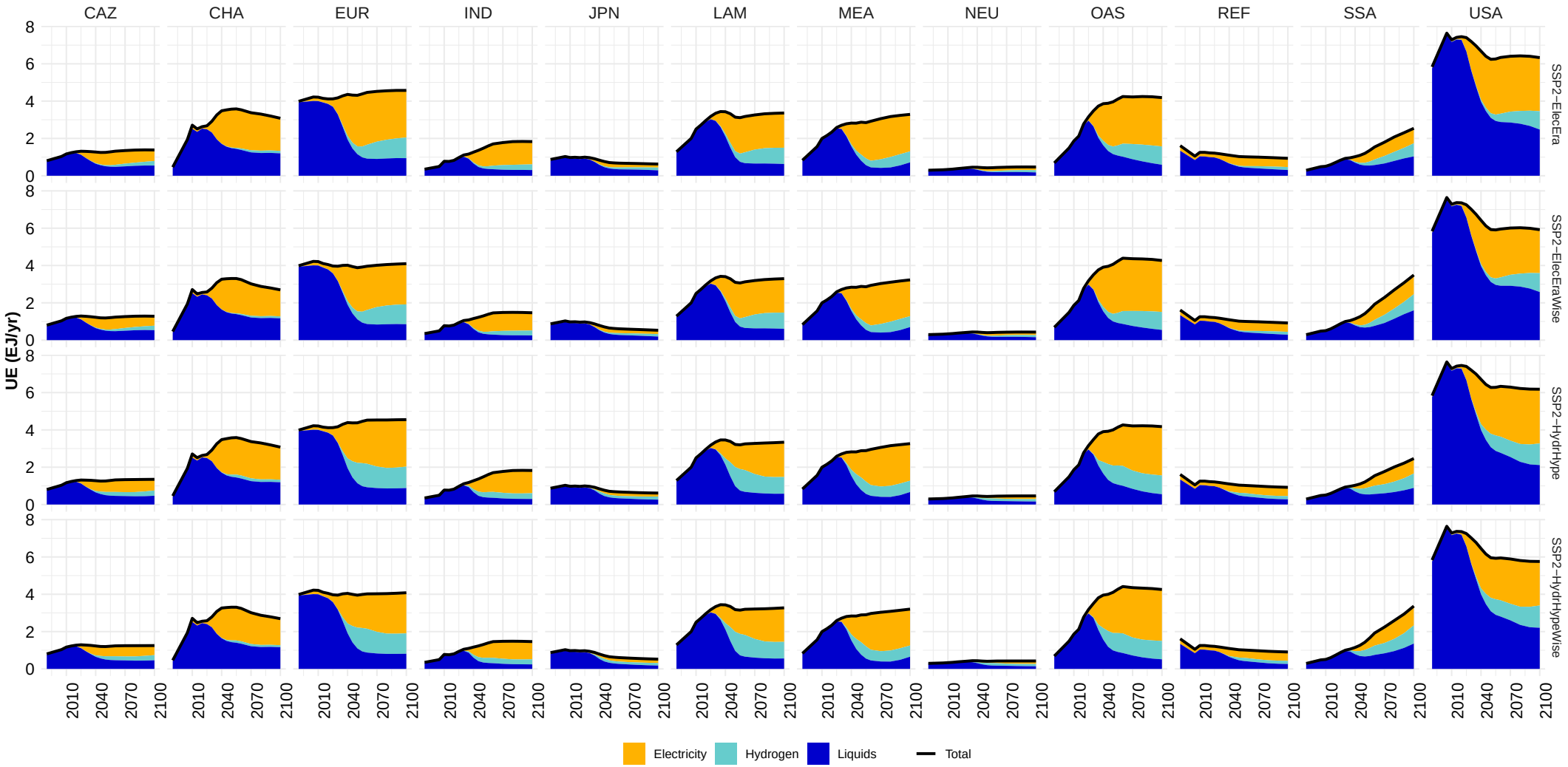

SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
UE (EJ/yr)
0
2
4
6
2010
2040
2070
2100
Total
CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA

1.5.7 W/O Bunkers



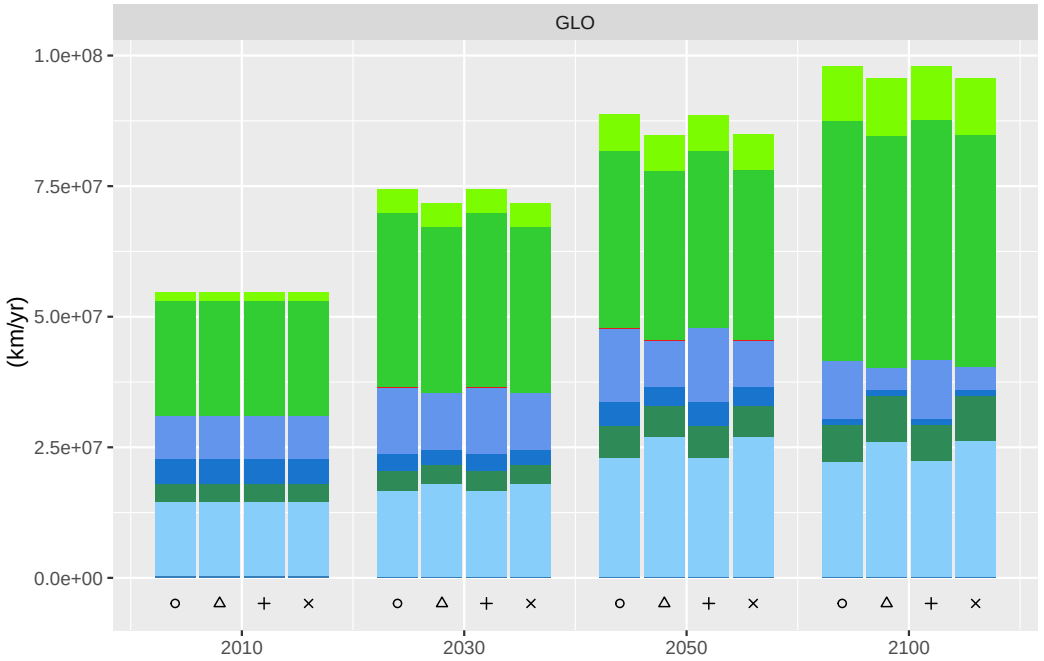


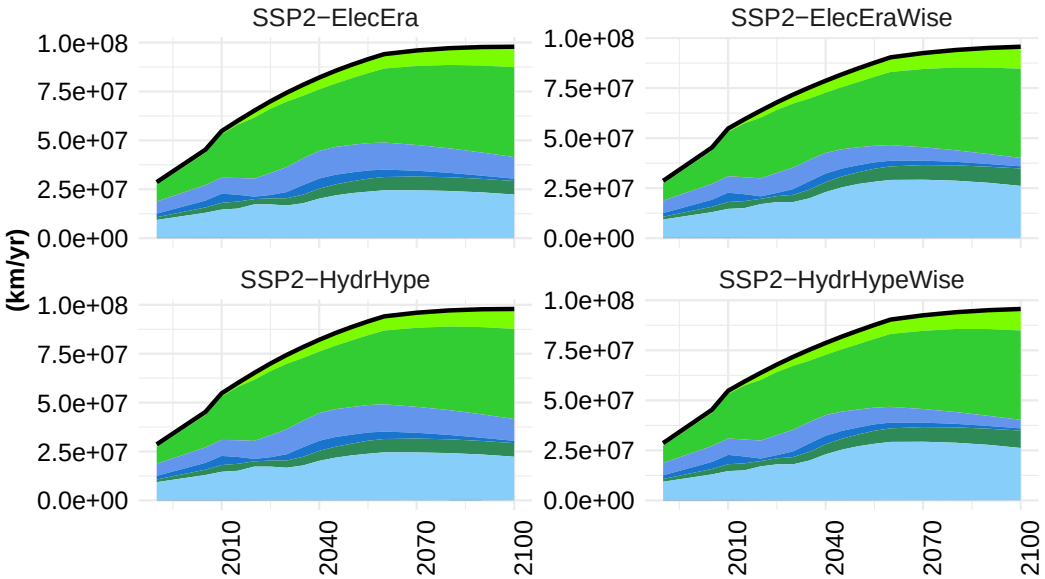


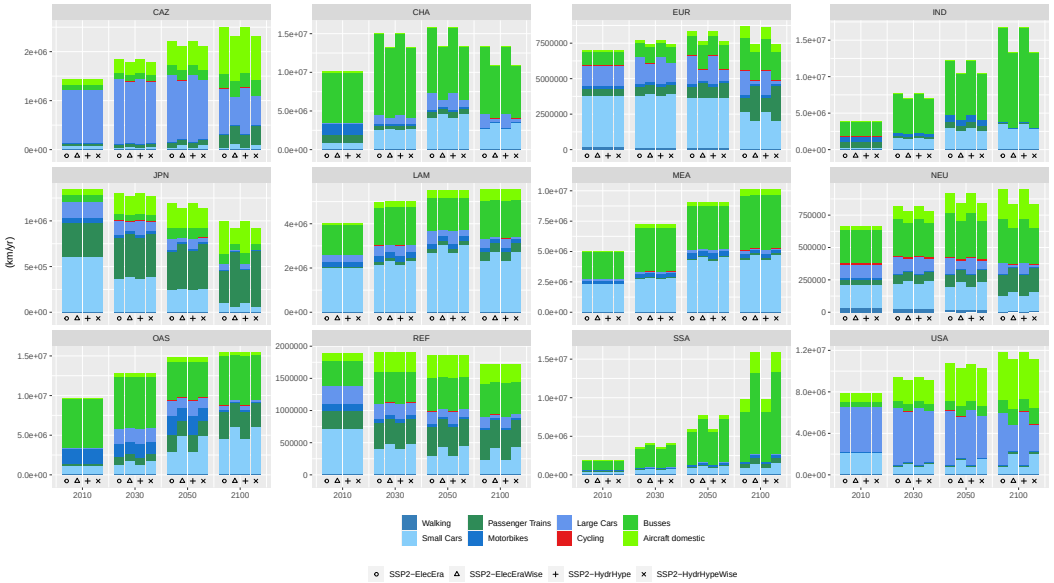

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
UE (EJ/yr)
0
2
4
6
8
2010
2040
2070
2100
Electricity
Hydrogen
Liquids
Total

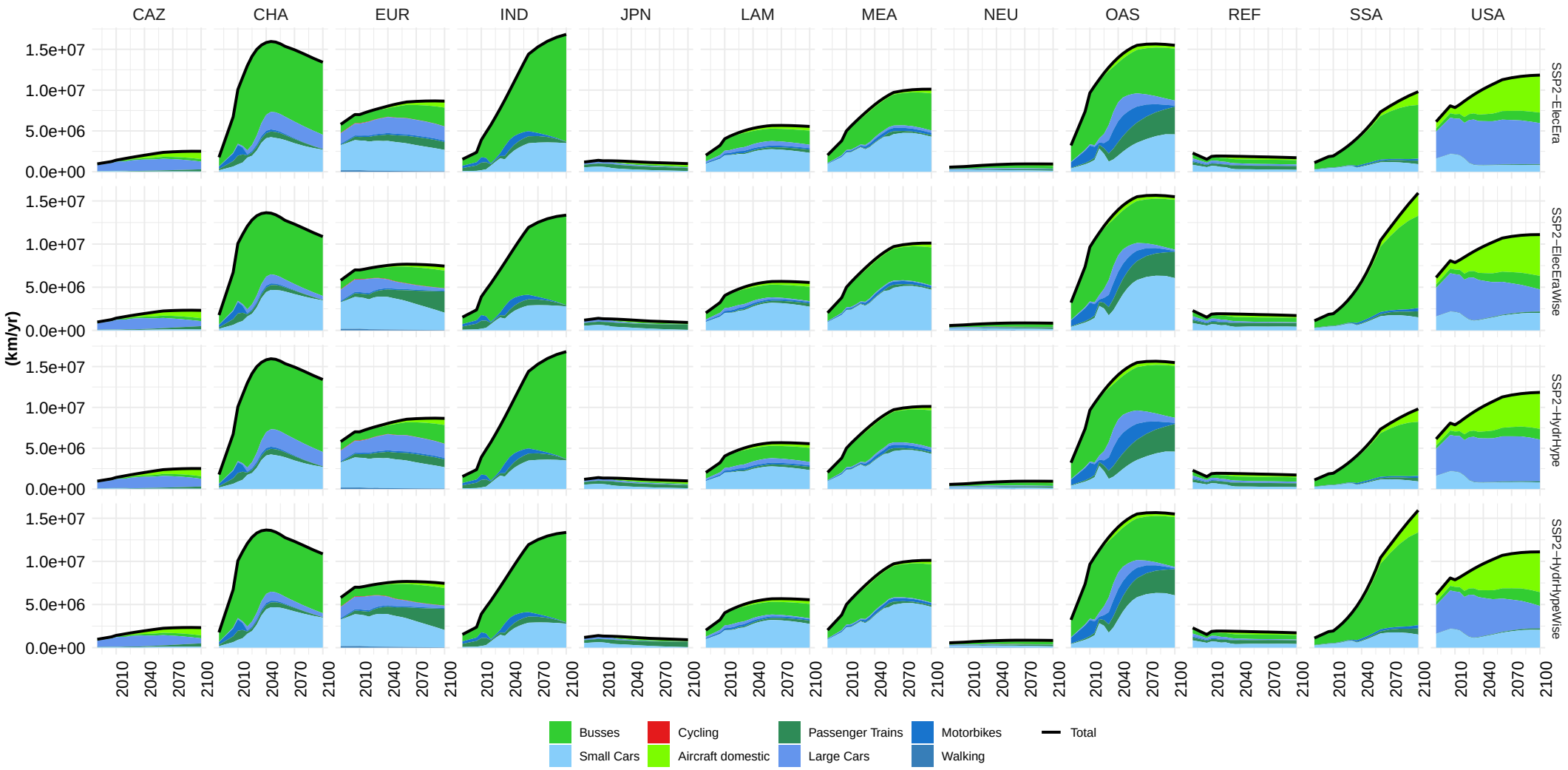
2 Energy services

2.1 Passenger without bunkers by vehicle type

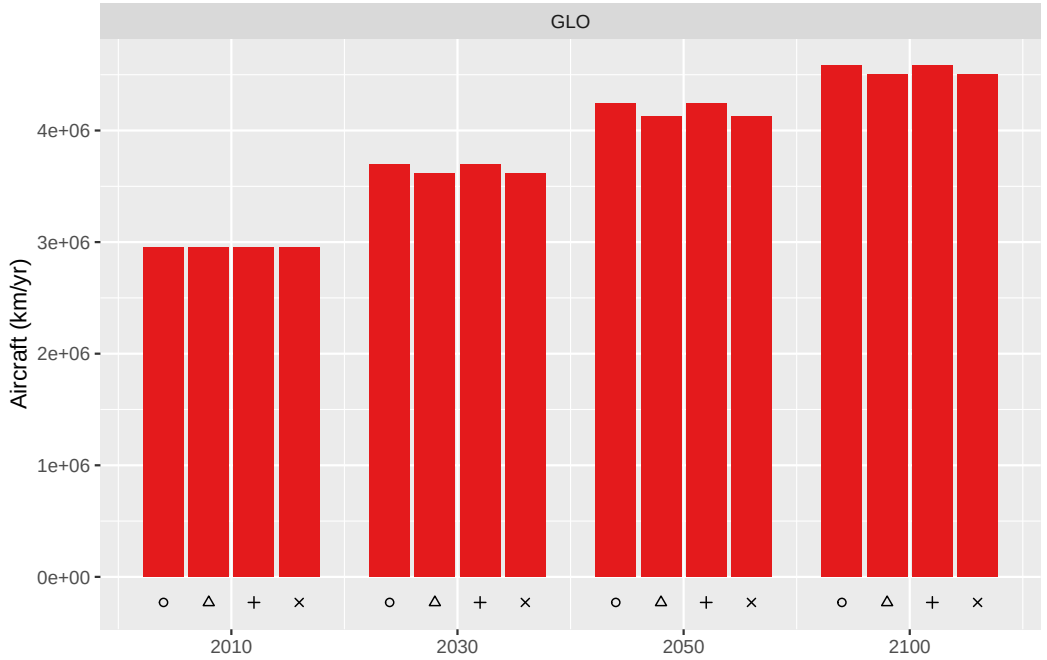


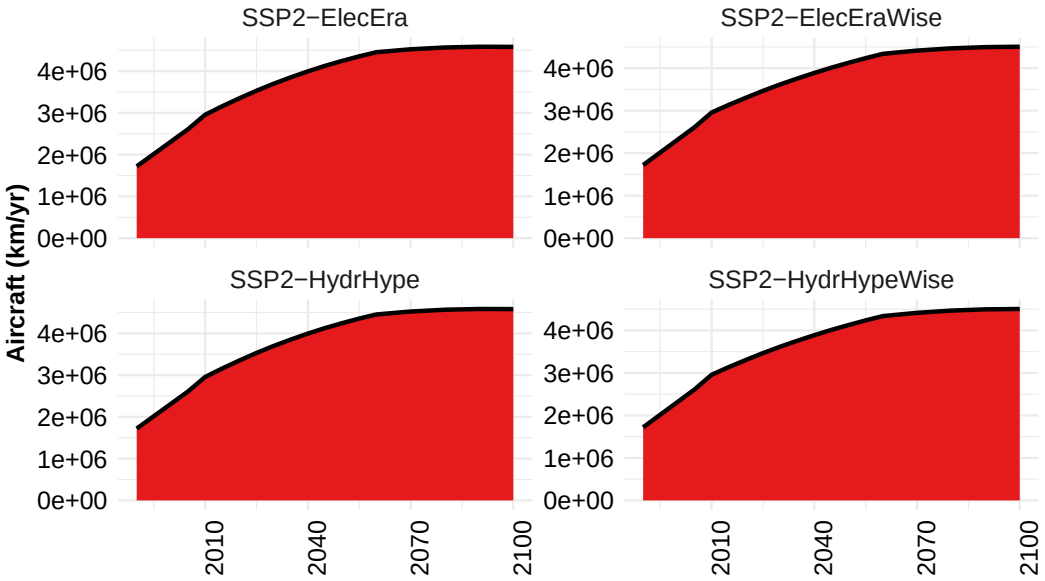


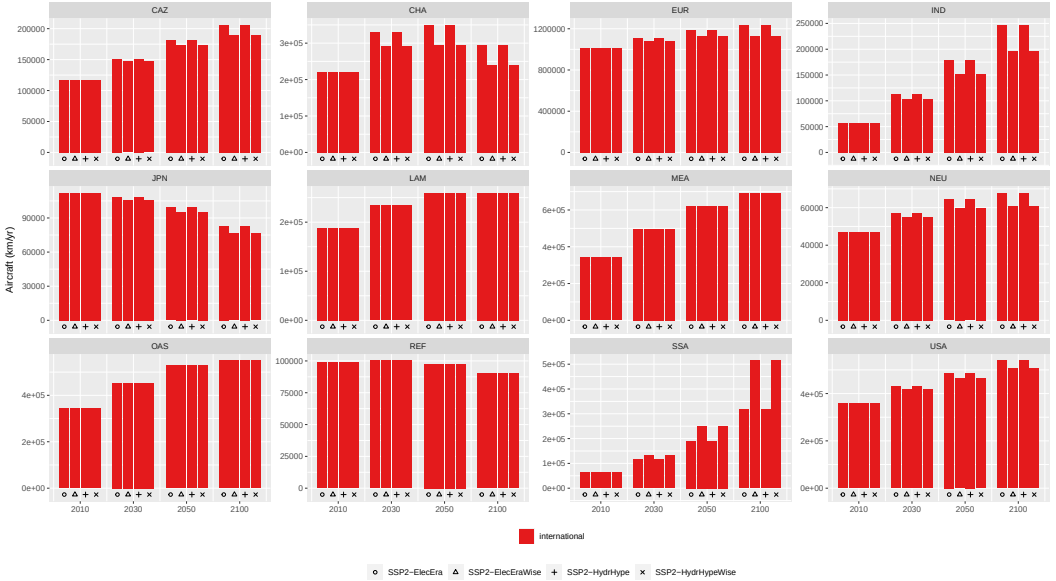


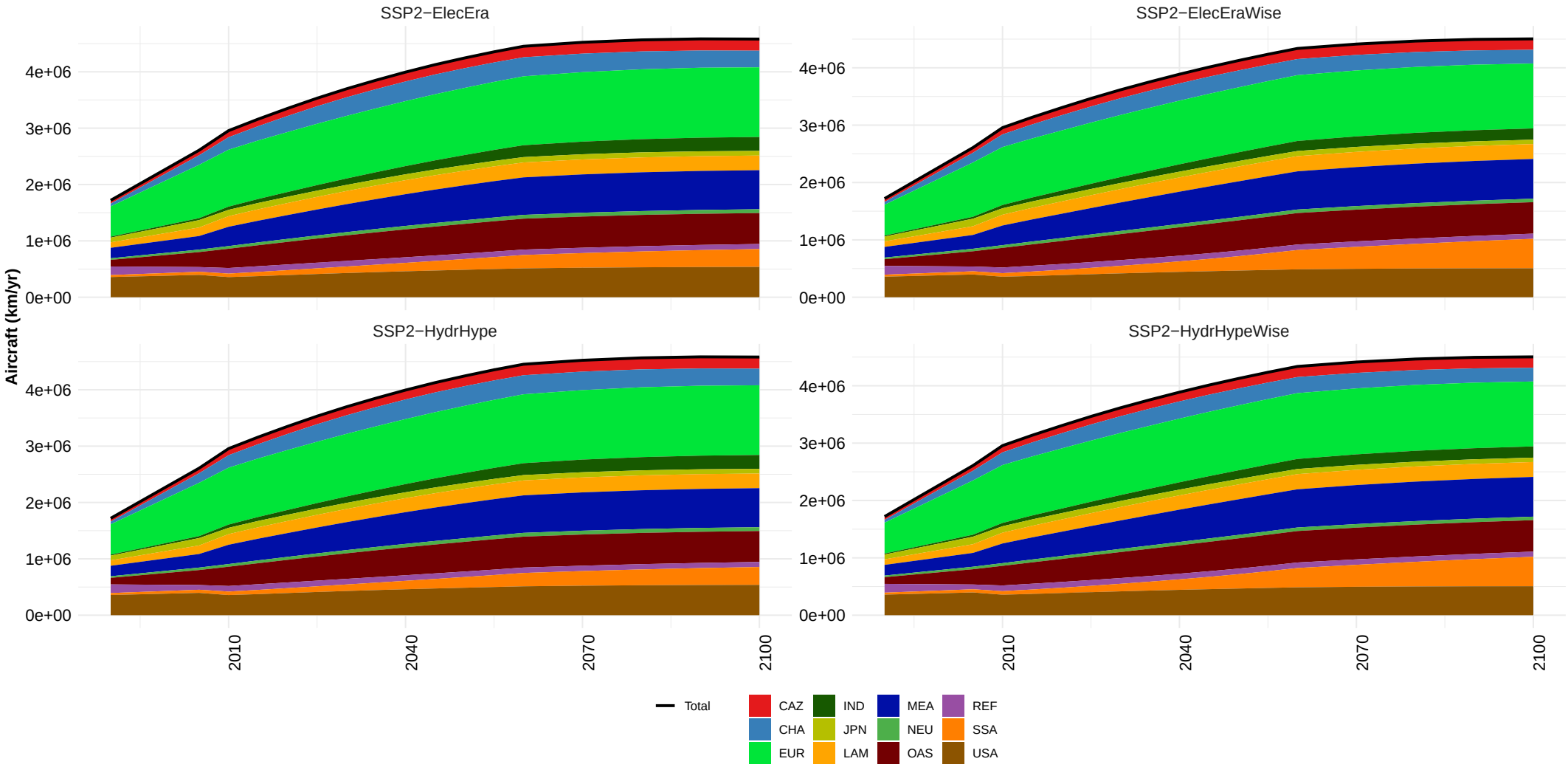

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
(km/yr)
1.5e+07
1.0e+07
5.0e+06
0.0e+00
2010
2040
2070
2100
Busses
Small Cars
Cycling
Aircraft domestic
Passenger Trains
Large Cars
Motorbikes
Walking
Total

2.2 Passenger bunkers

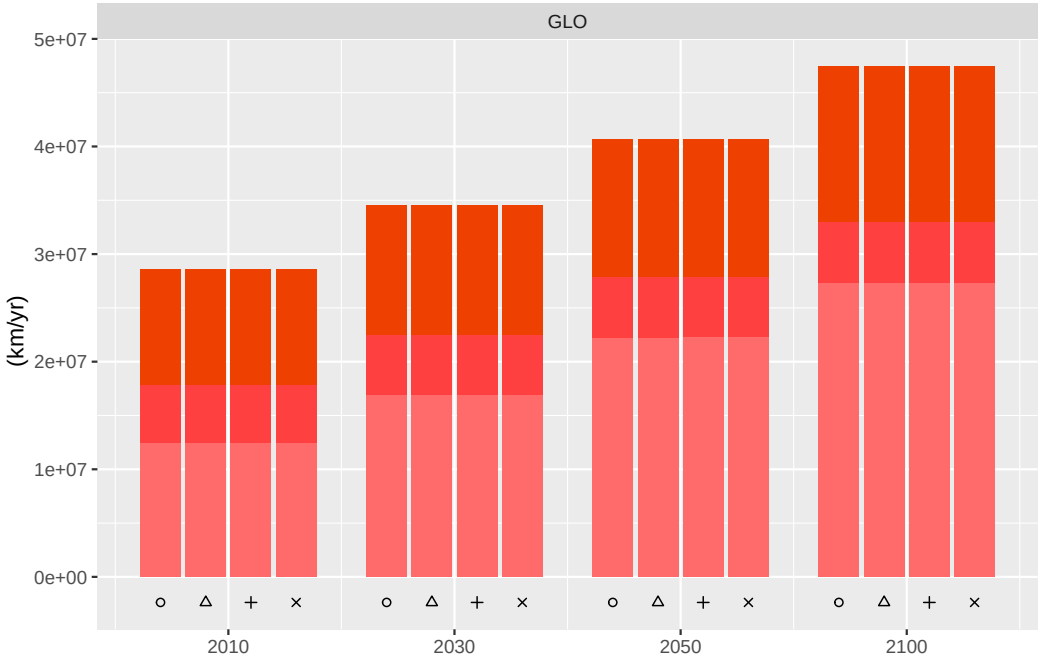


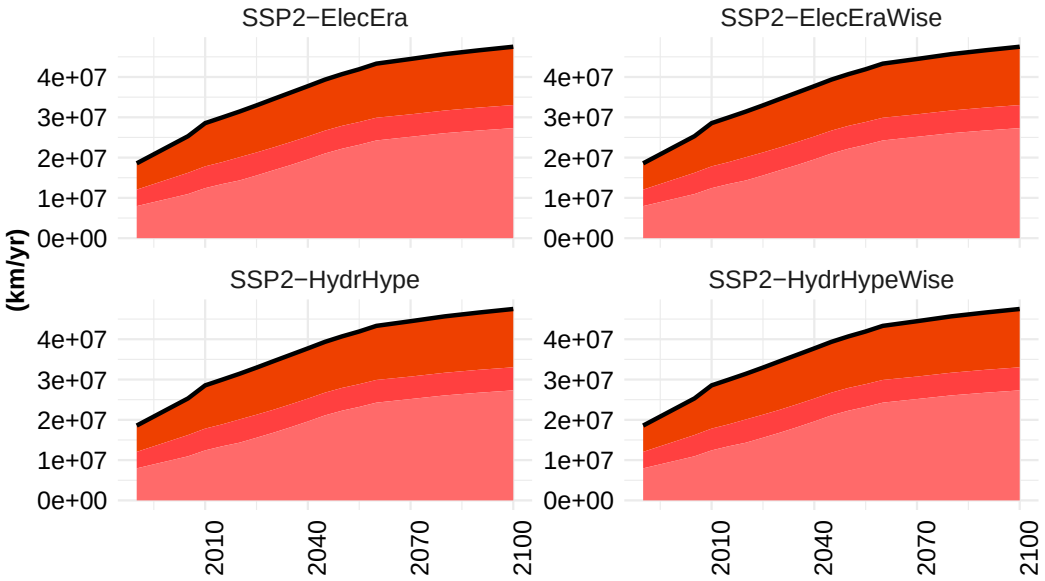


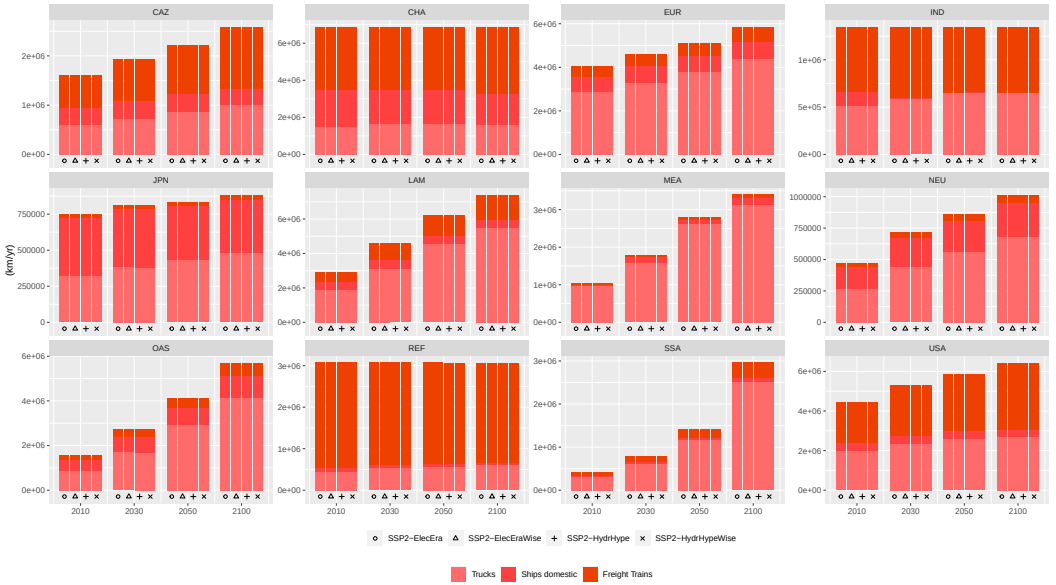


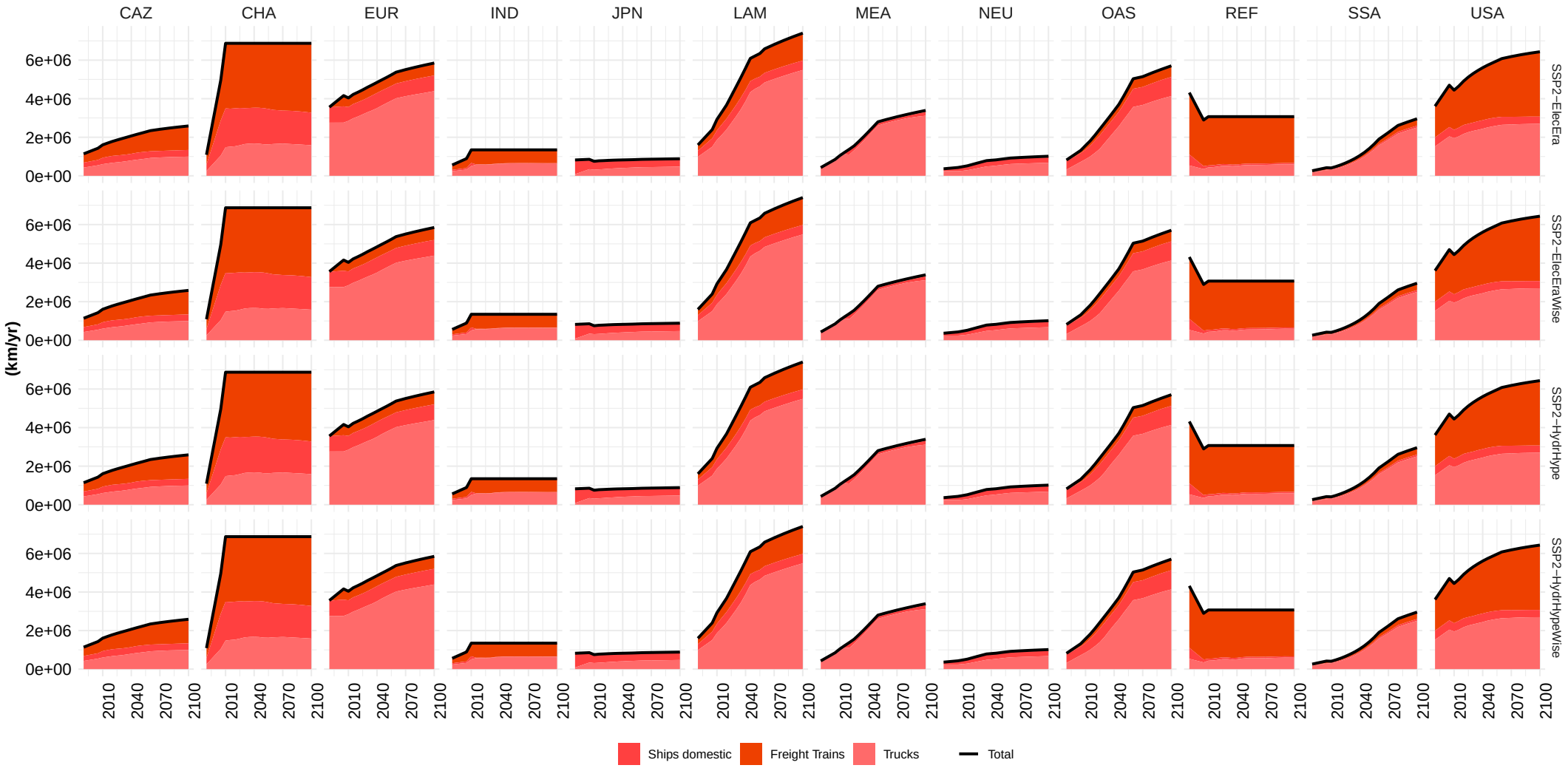

SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
Aircraft (km/yr)
0e+00
1e+06
2e+06
3e+06
4e+06
2010
2040
2070
2100
Total
CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA

2.3 Freight without bunkers by vehicle type

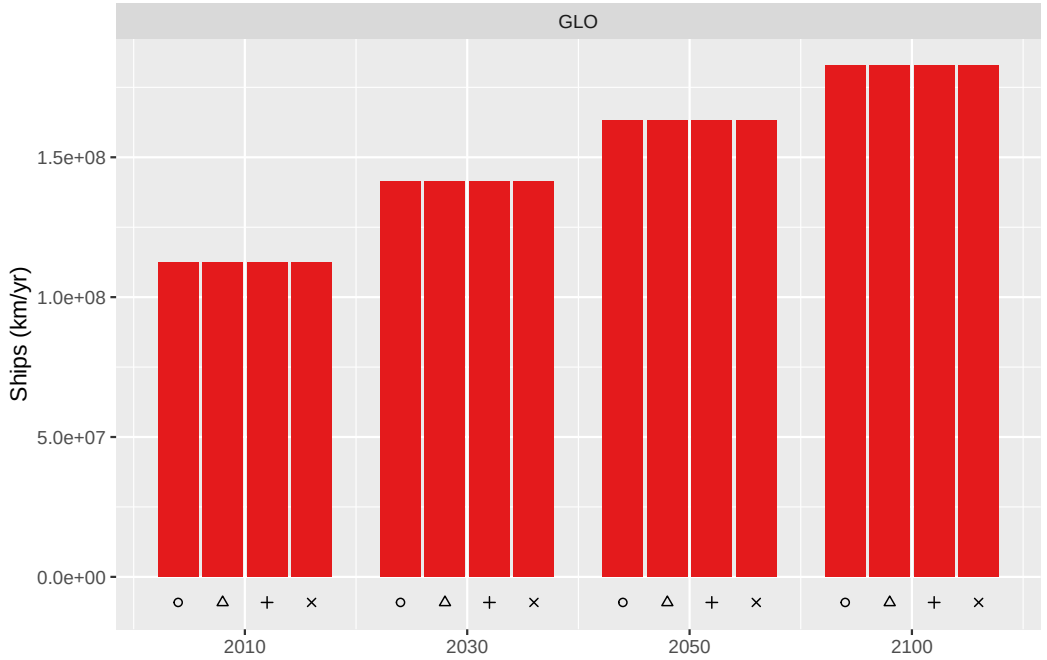


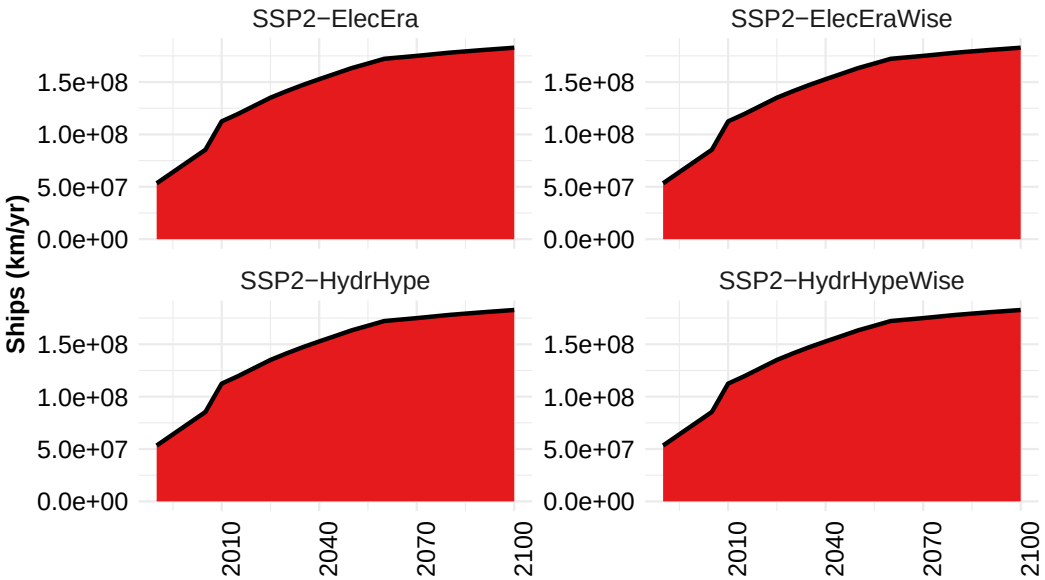


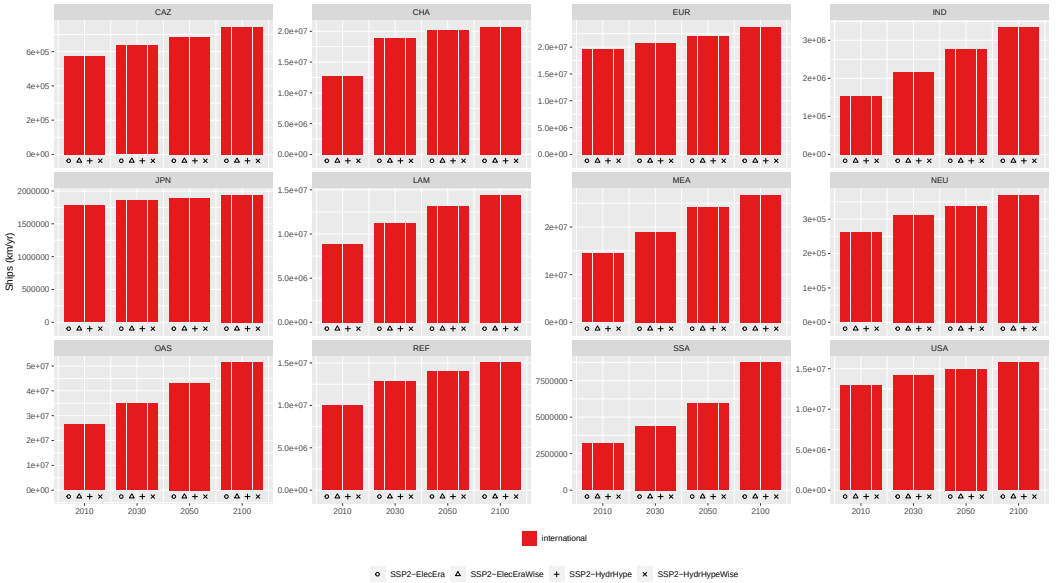


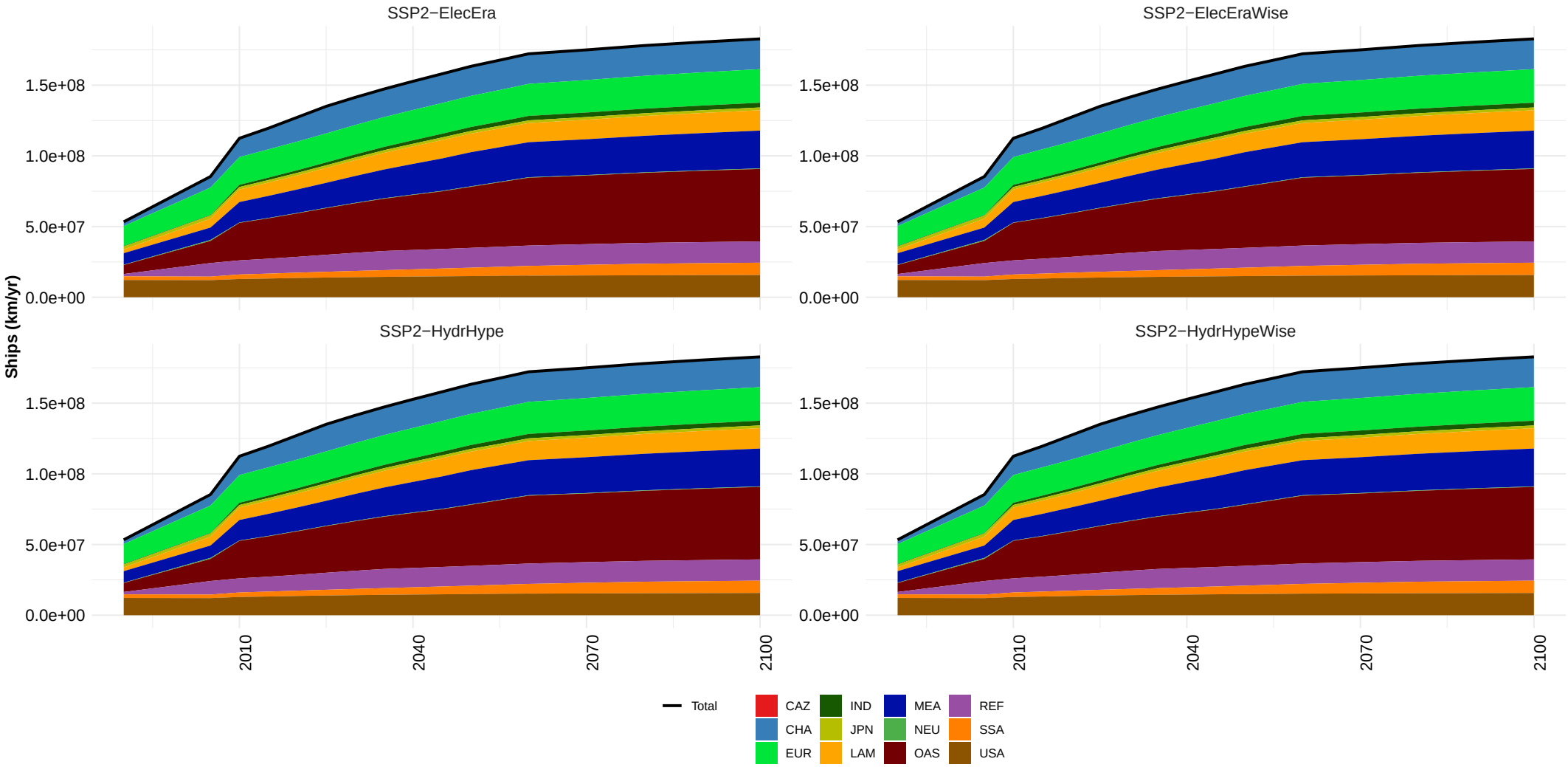

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
(km/yr)
0e+00
2e+06
4e+06
6e+06
2010
2040
2070
2100
Ships domestic
Freight Trains
Trucks
Total

2.4 Freight bunkers by vehicle type

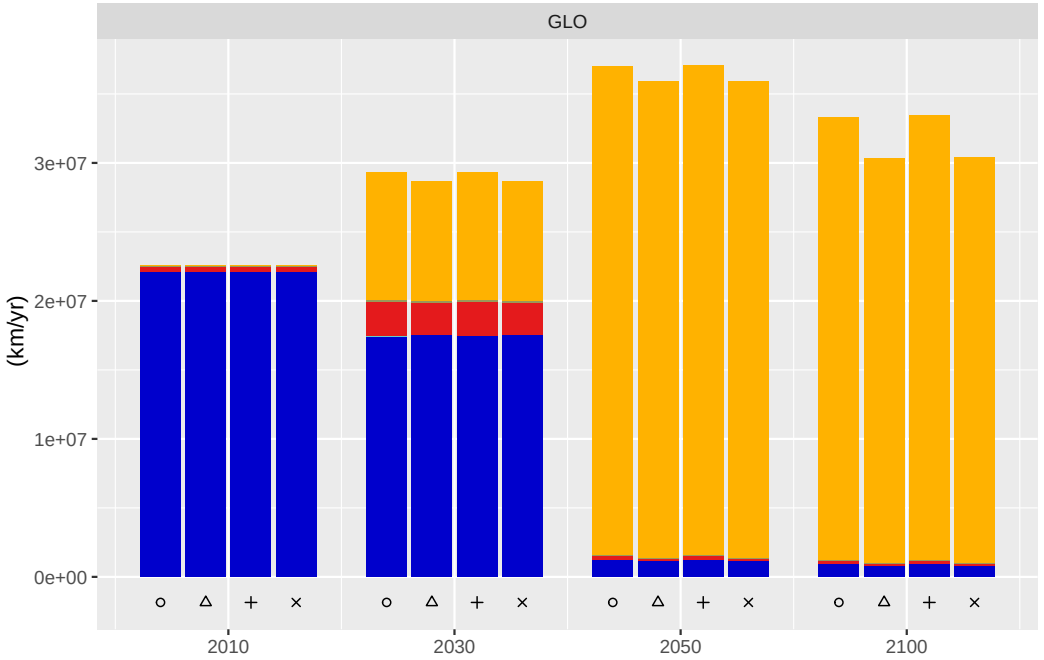


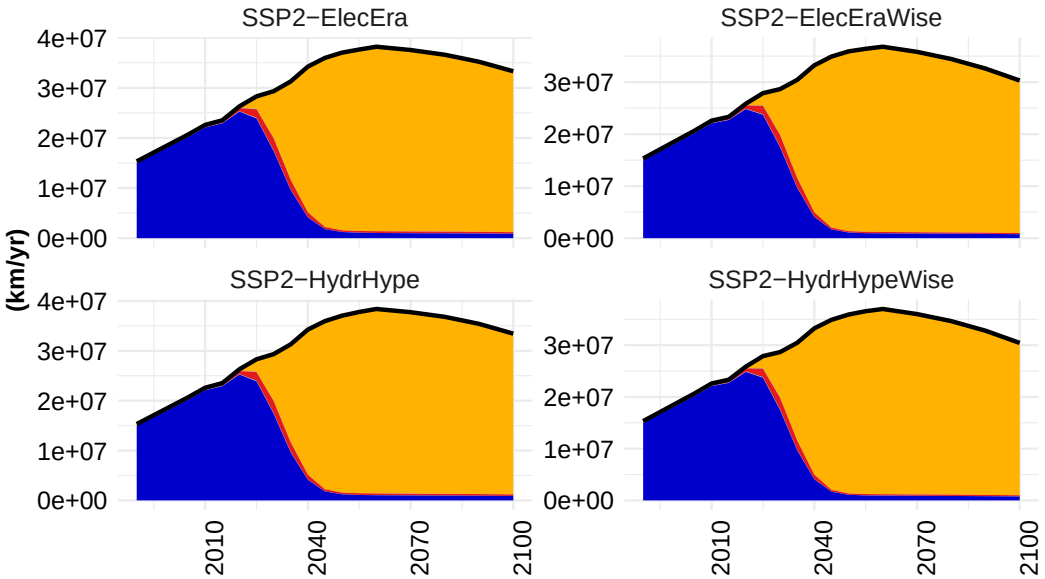


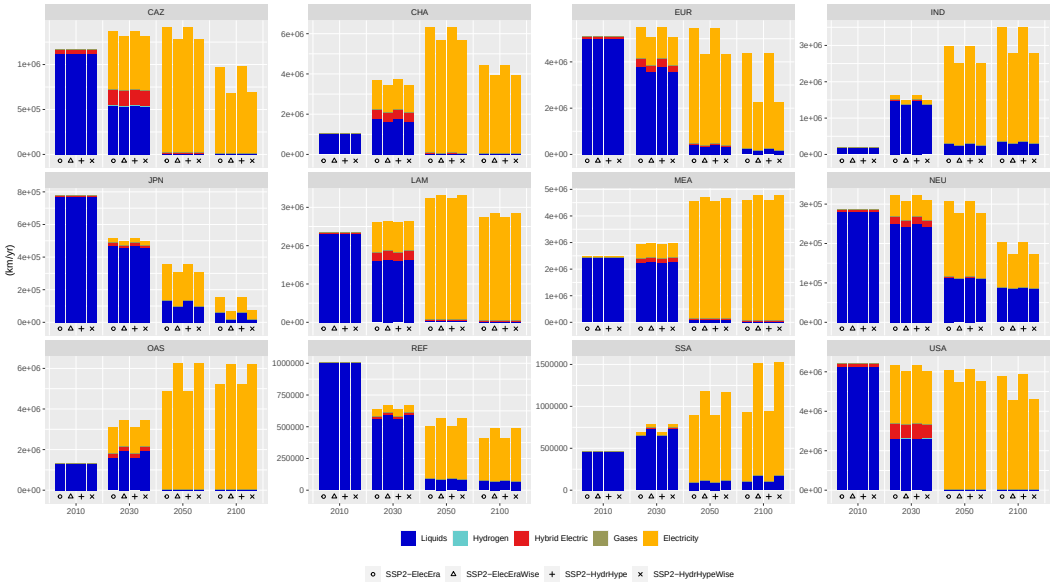


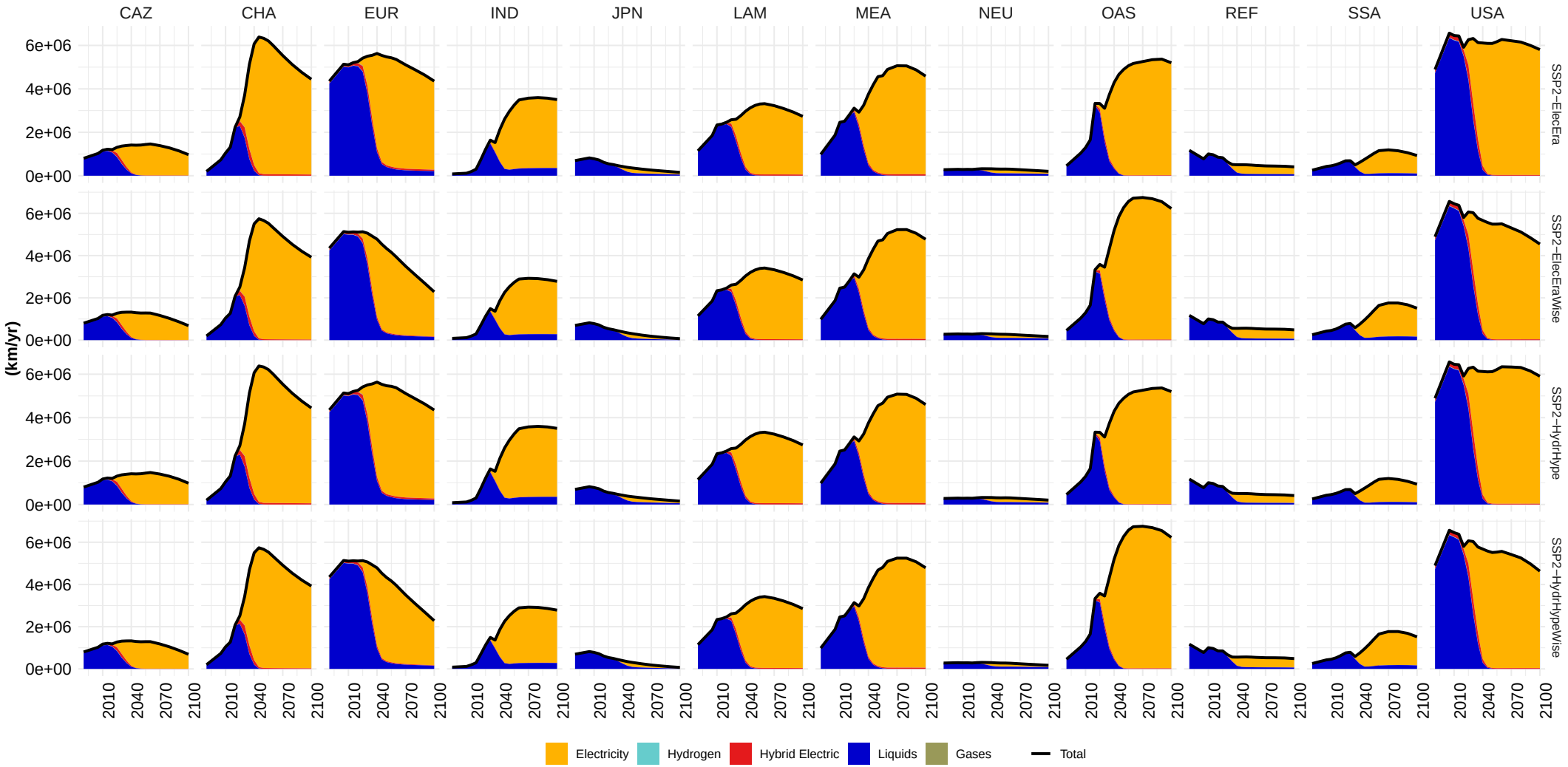

SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
Ships (km/yr)
1.5e+08
1.0e+08
5.0e+07
0.0e+00
2010
2040
2070
2100
Total
CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA

2.5 LDV's by technology

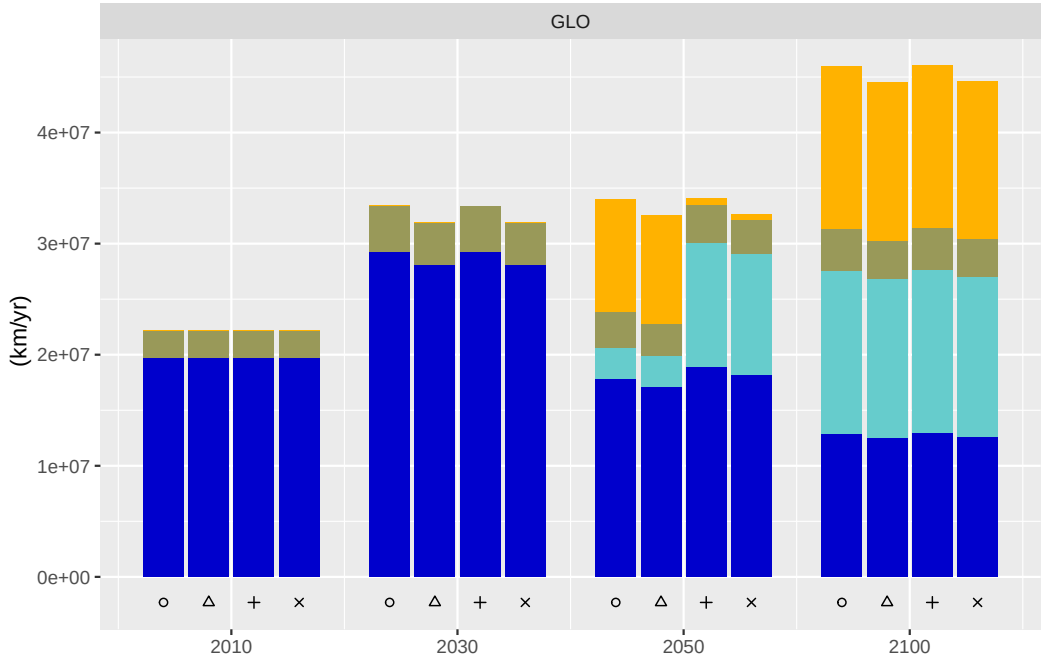


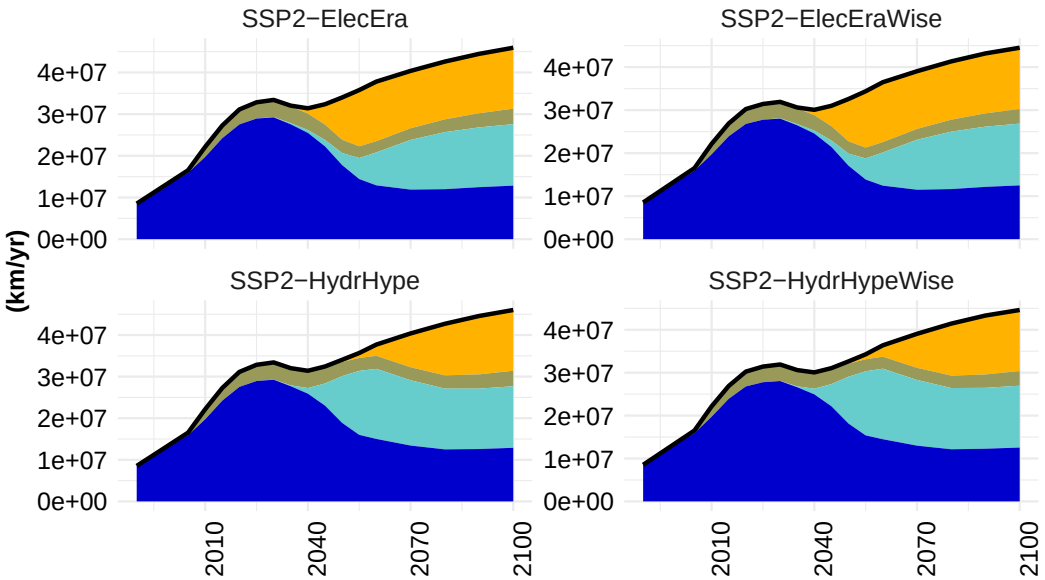


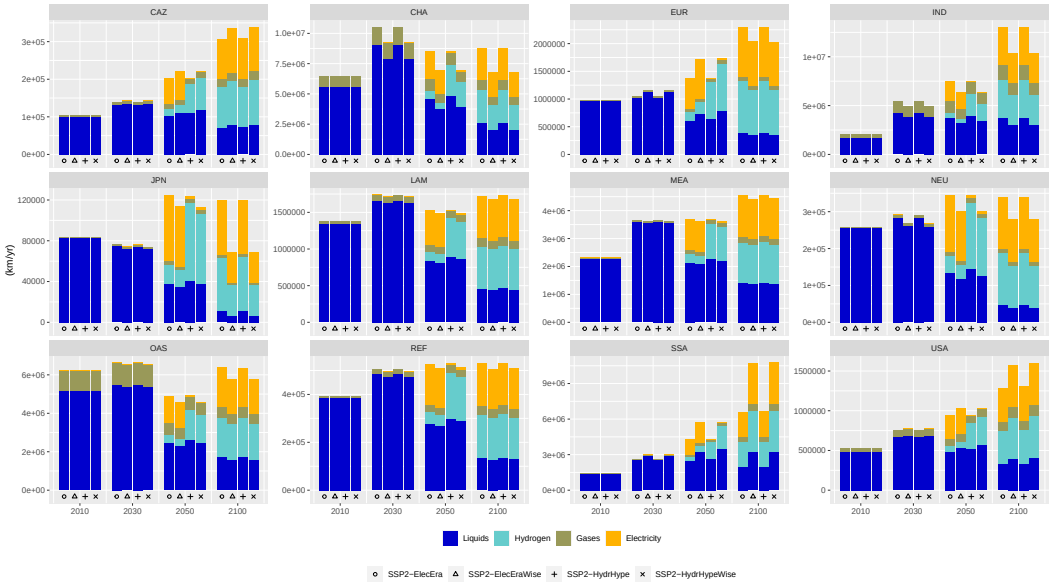


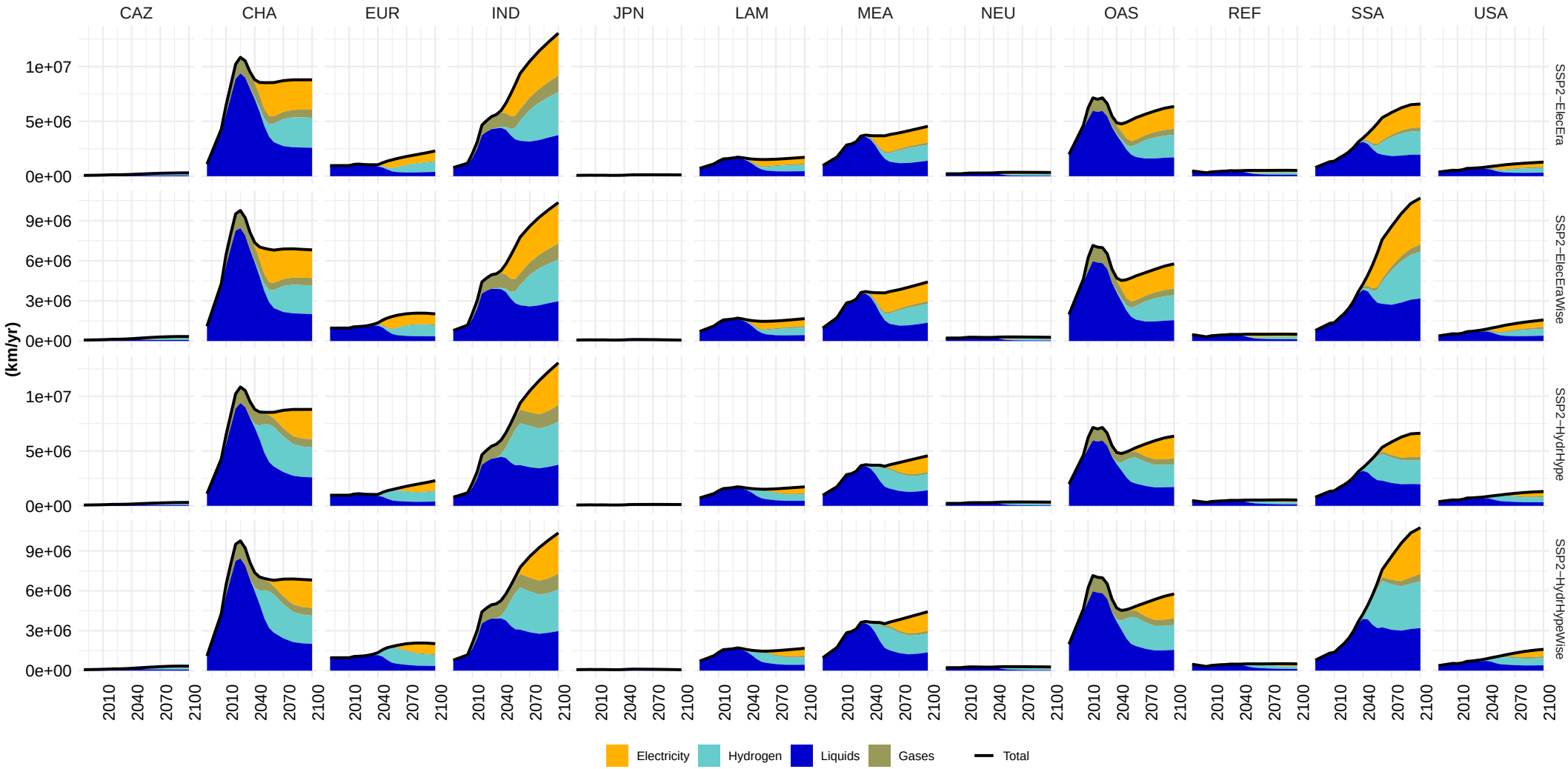

CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
(km/yr)
0e+00
2e+06
4e+06
6e+06
2010
2040
2070
2100
Electricity
Hydrogen
Hybrid Electric
Liquids
Gases
Total

2.6 Busses by technology

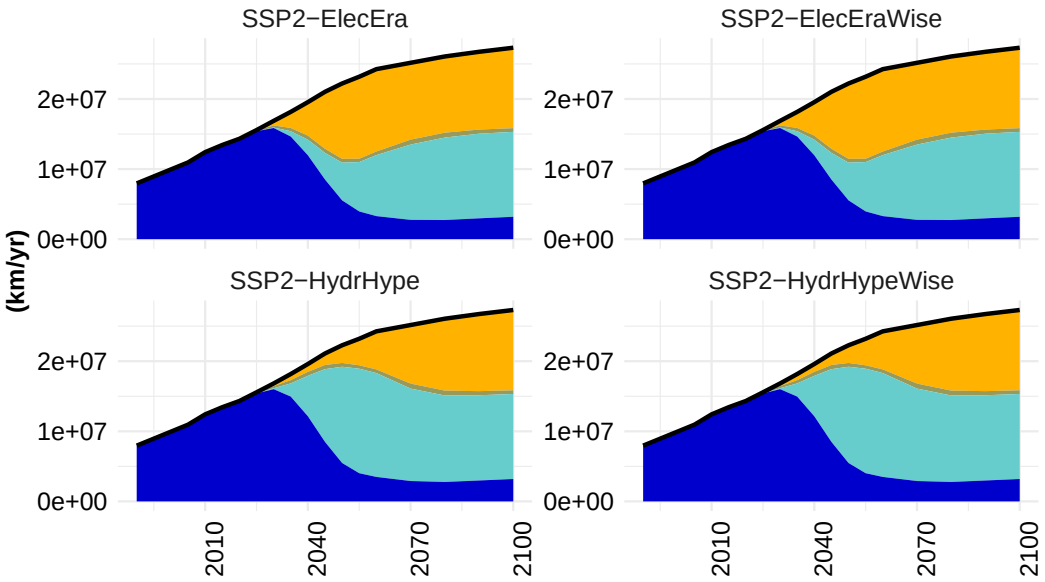


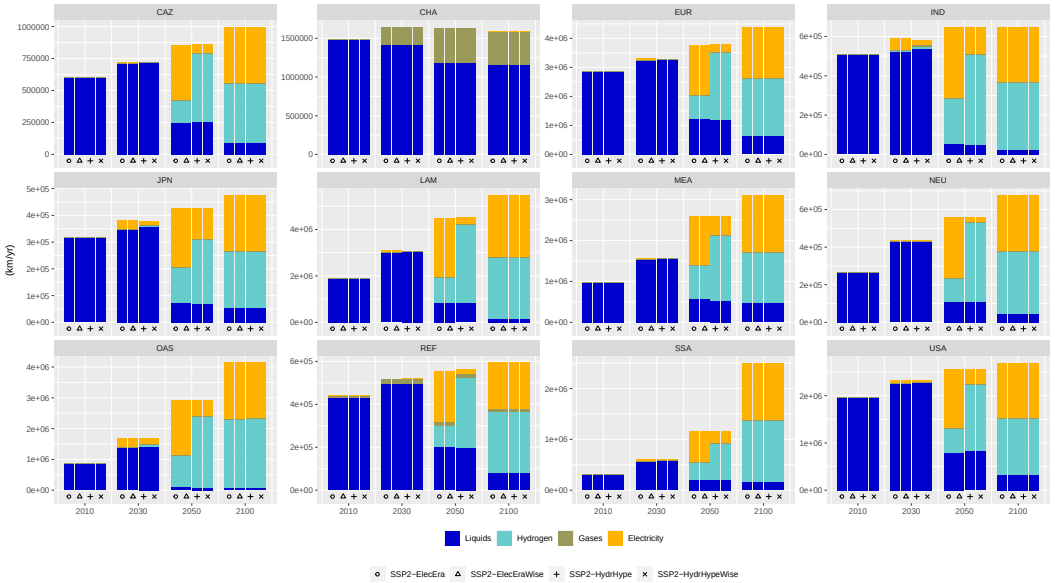


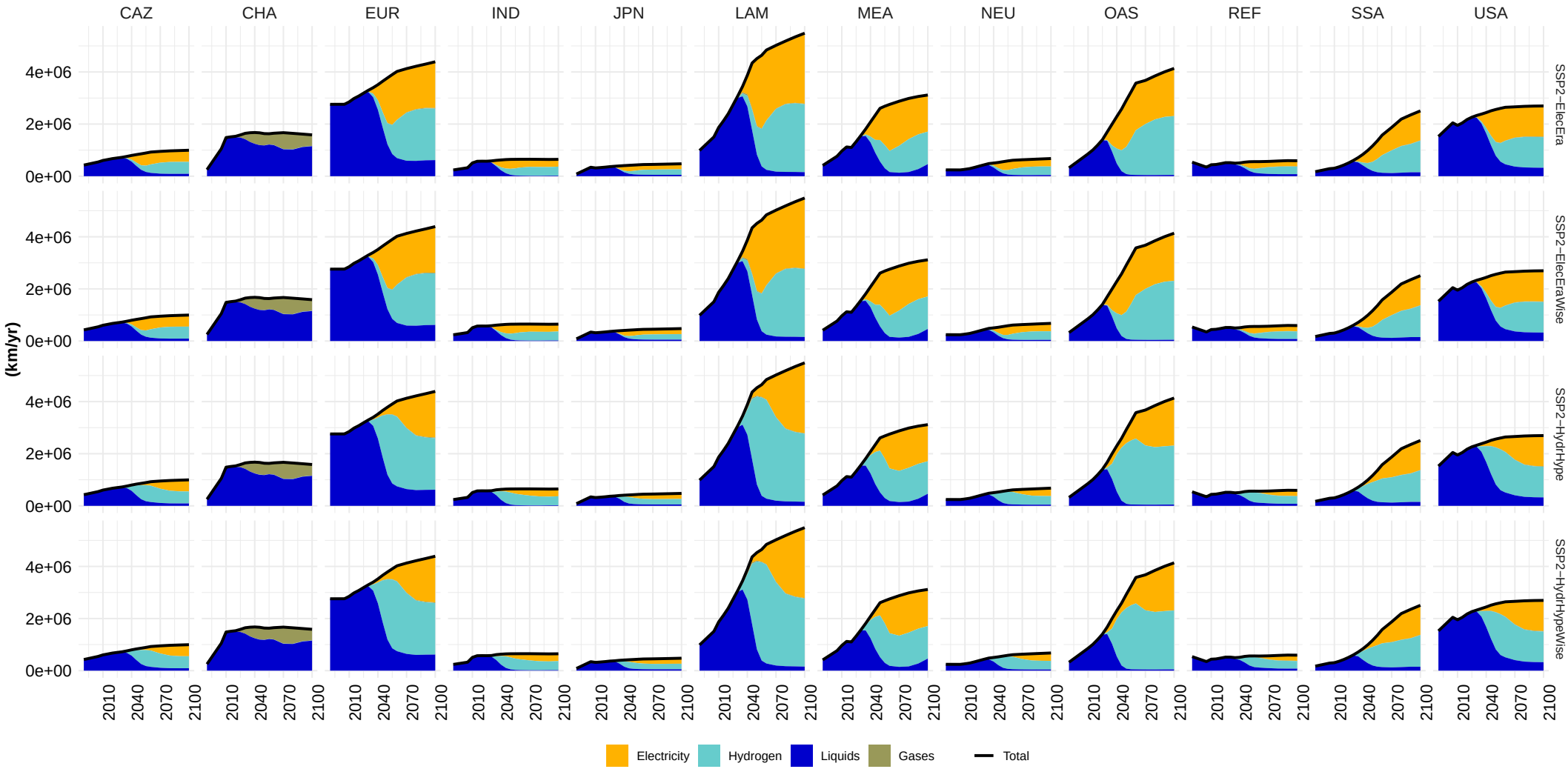



CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
(km/yr)
0e+00
3e+06
5e+06
6e+06
9e+06
1e+07
2010
2040
2070
2100
Electricity
Hydrogen
Liquids
Gases
Total

2.7 Trucks by technology



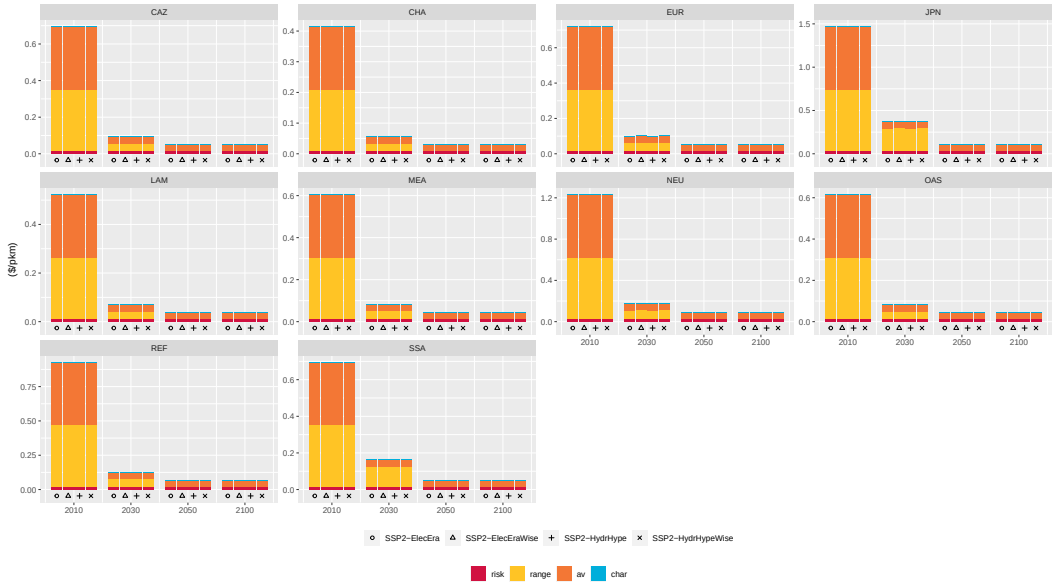



CAZ
CHA
EUR
IND
JPN
LAM
MEA
NEU
OAS
REF
SSA
USA
SSP2−ElecEra
SSP2−ElecEraWise
SSP2−HydrHype
SSP2−HydrHypeWise
(km/yr)
0e+00
2e+06
4e+06
2010
2040
2070
2100
Electricity
Hydrogen
Liquids
Gases
Total

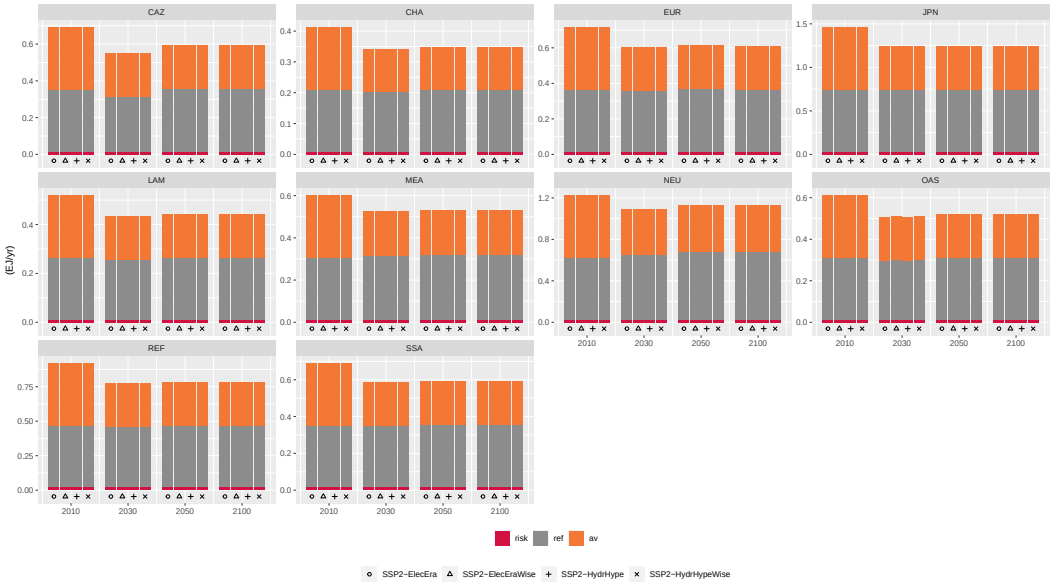
3 Cost trends

3.1 Example large car and SUV

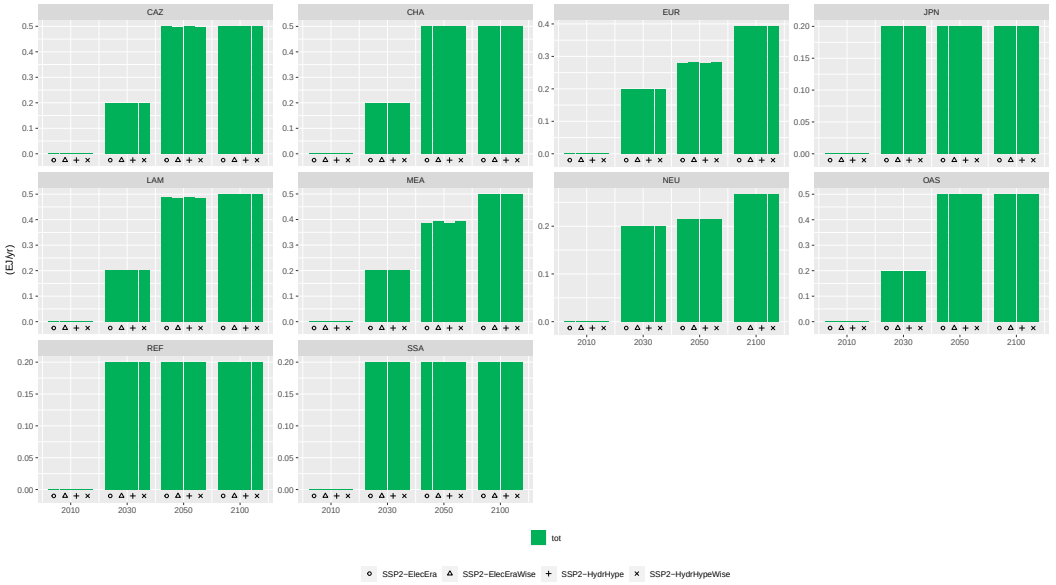
3.1.1 BEV



3.1.2 FCEV



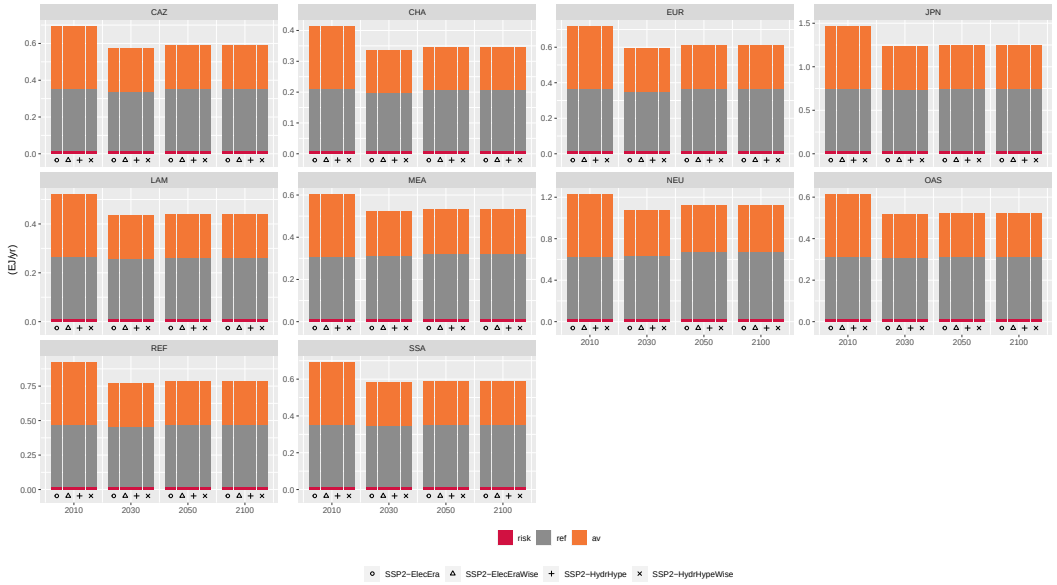
3.1.3 Liquids

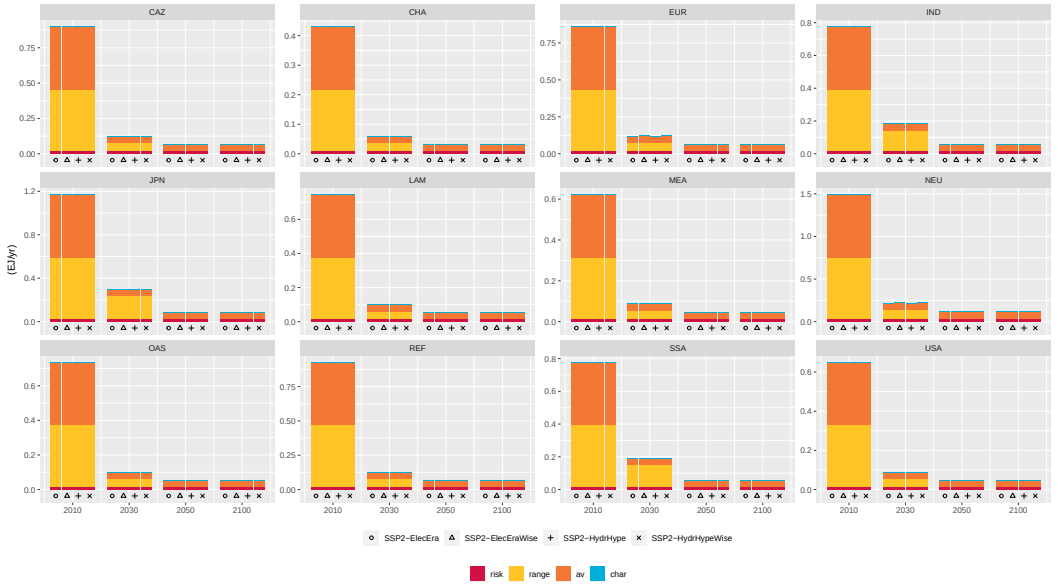


3.1.4 NG

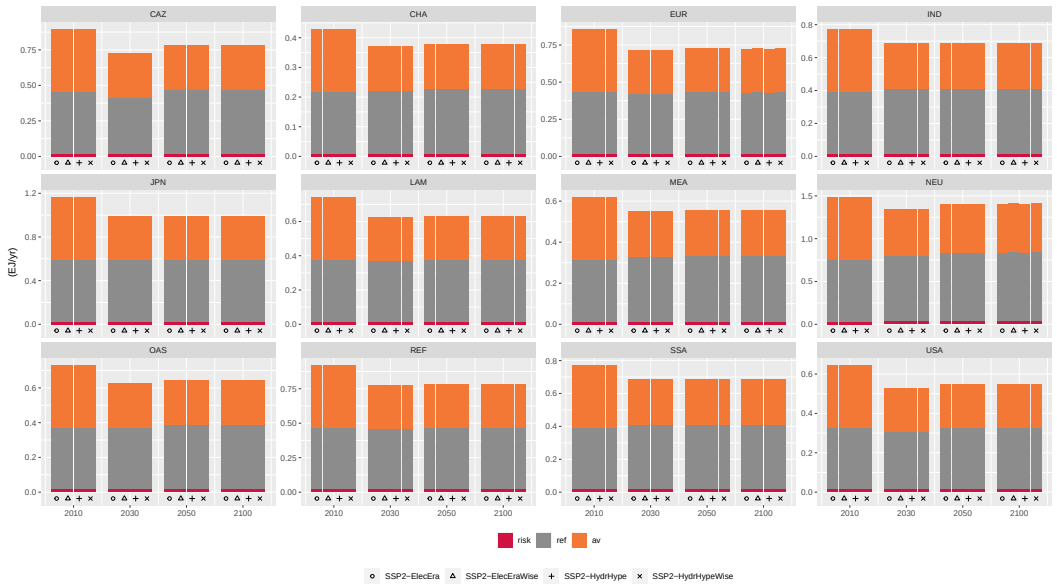
3.2 Example compact car

3.2.1 BEV

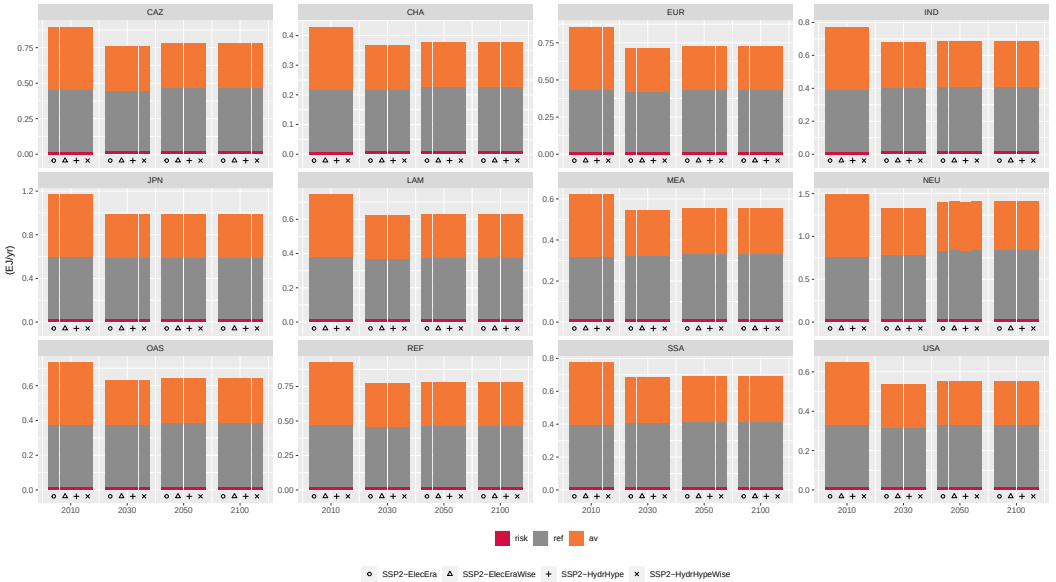
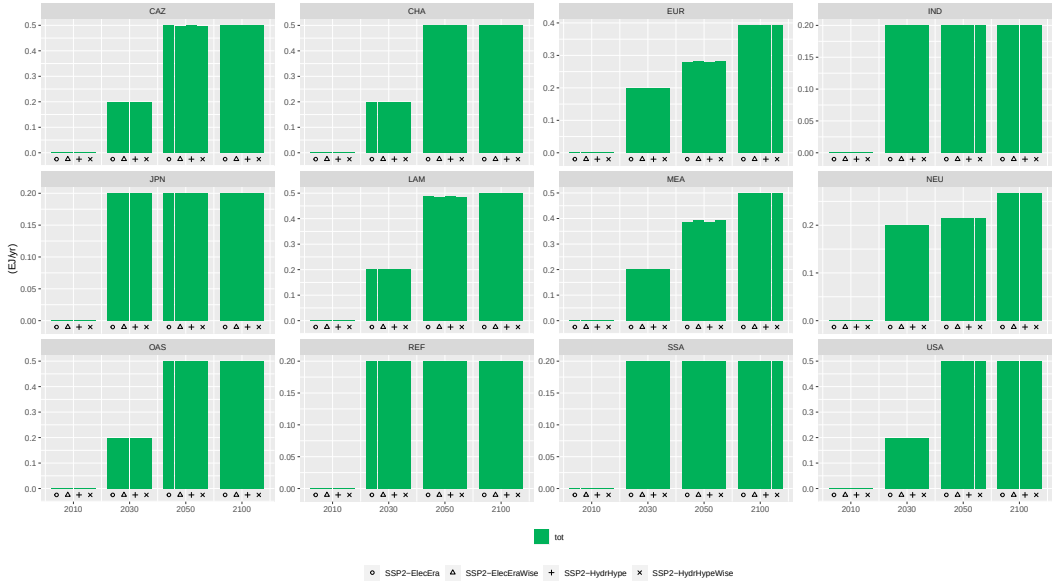




3.2.2 FCEV



3.2.4 NG



3.2.3 Liquids