

# Trajectories, crop caps and E10 analysis

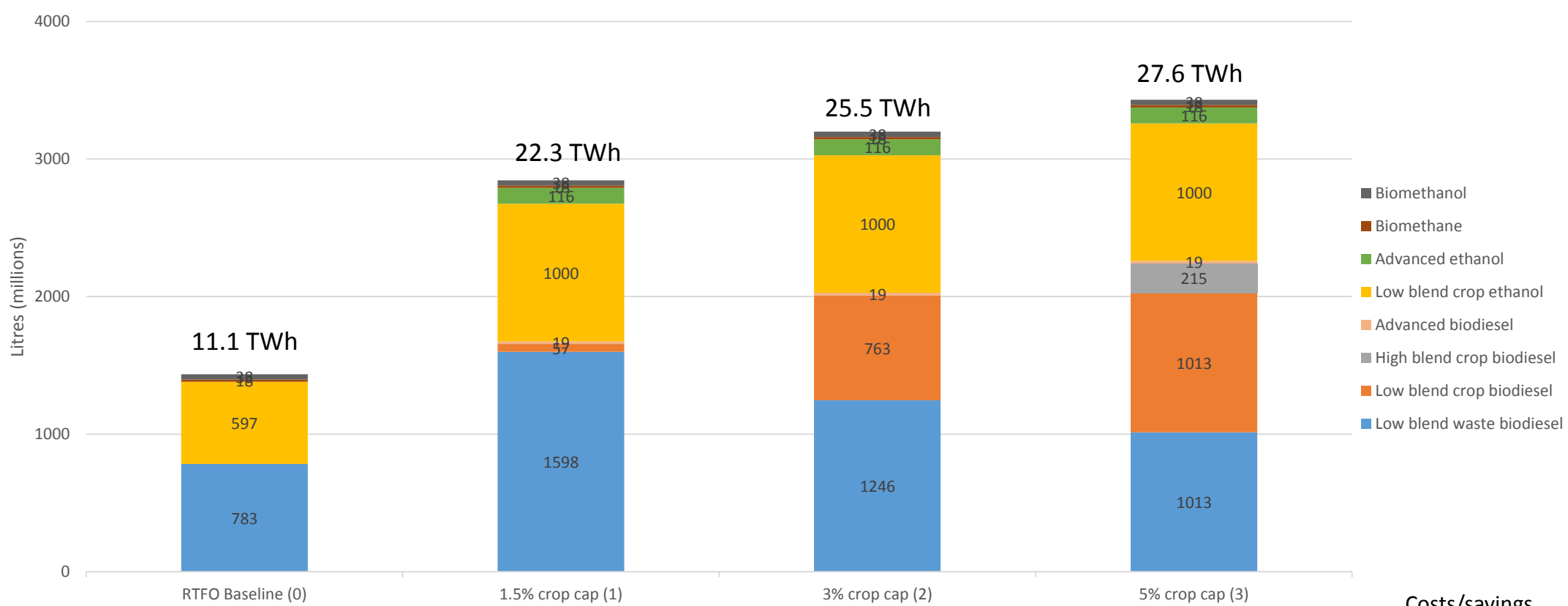
Thomas Robertson, DfT

# Overview

- Transport Energy Taskforce (TETF) met September 2014 – March 2015, issued findings in March.
  - Examined the evidence and formulated options for policy.
- Since then, DfT has built on this work to examine more detailed policy options, and consider trajectories out to both 2020 and 2030.

**2020  
E10 SUCCESS:**

**2020  
SUPPLY  
MIX:**



**GHG SAVINGS  
(MTCO2e):**

**% TOTAL FUEL VOL:**

**CROP SHARE:  
(energy)**

**COSTS:  
(2014 £s)**

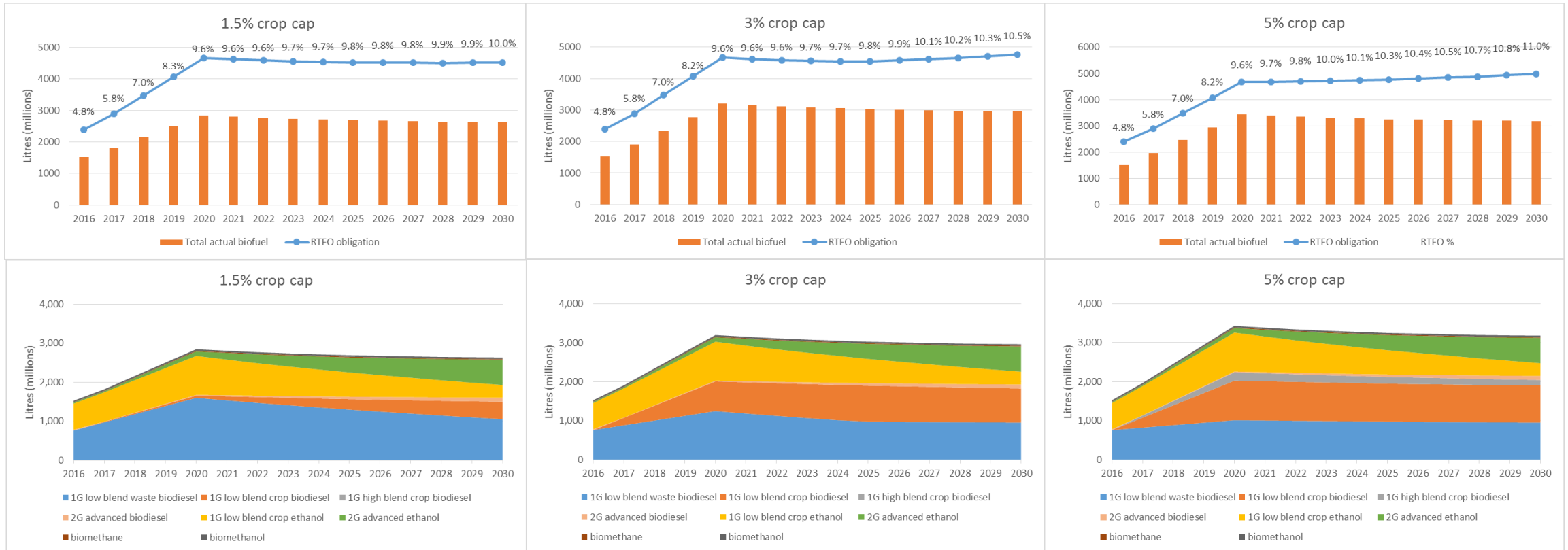
**PPL IMPACT:  
(2014 pence)**

Scenario	GHG Savings (MTCO2e)	% Total Fuel Vol	Crop Share (energy)	Costs (2014 £s)	PPL Impact (2014 pence)
RTFO Baseline (0)	2.5	3%	0.8%	314m/year 28/MWh 127/tCO2	0.9
1.5% crop cap (1)	+2.5	5.8%	1.5%	+408m/year 36/MWh 162/tCO2	+1.0
3% crop cap (2)	+1.7	6.6%	3%	+408m/year 28/MWh 246/tCO2	+1.0
5% crop cap (3)	+1.1	7%	4%	+298m/year 24/MWh 363/tCO2	+1.1

Costs/savings above and beyond 'do nothing' scenario.

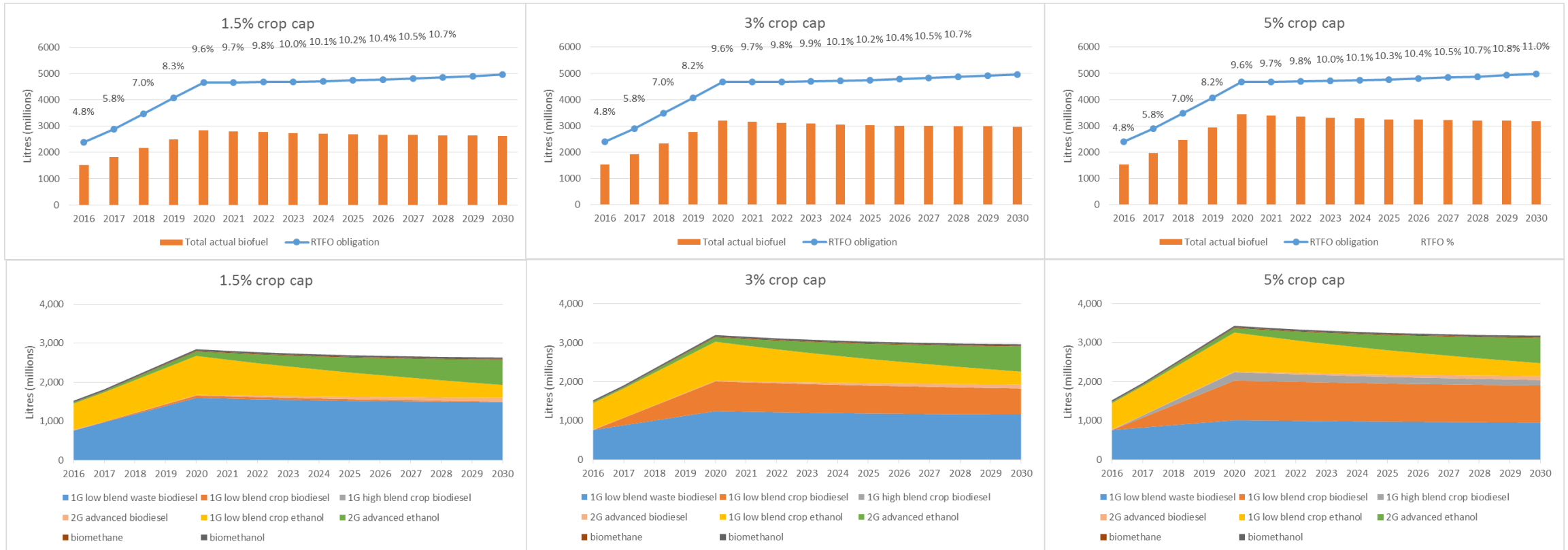
NB – advanced sub-target of 0.2% in 2020 for scenarios 1,2 and 3, rising to 1.2% in 2030. None in 0.

# E10 success, crop cap maintained



Crop ethanol does not benefit from keeping the crop cap fixed, though room is created for crop biodiesel as advanced ethanol grows.

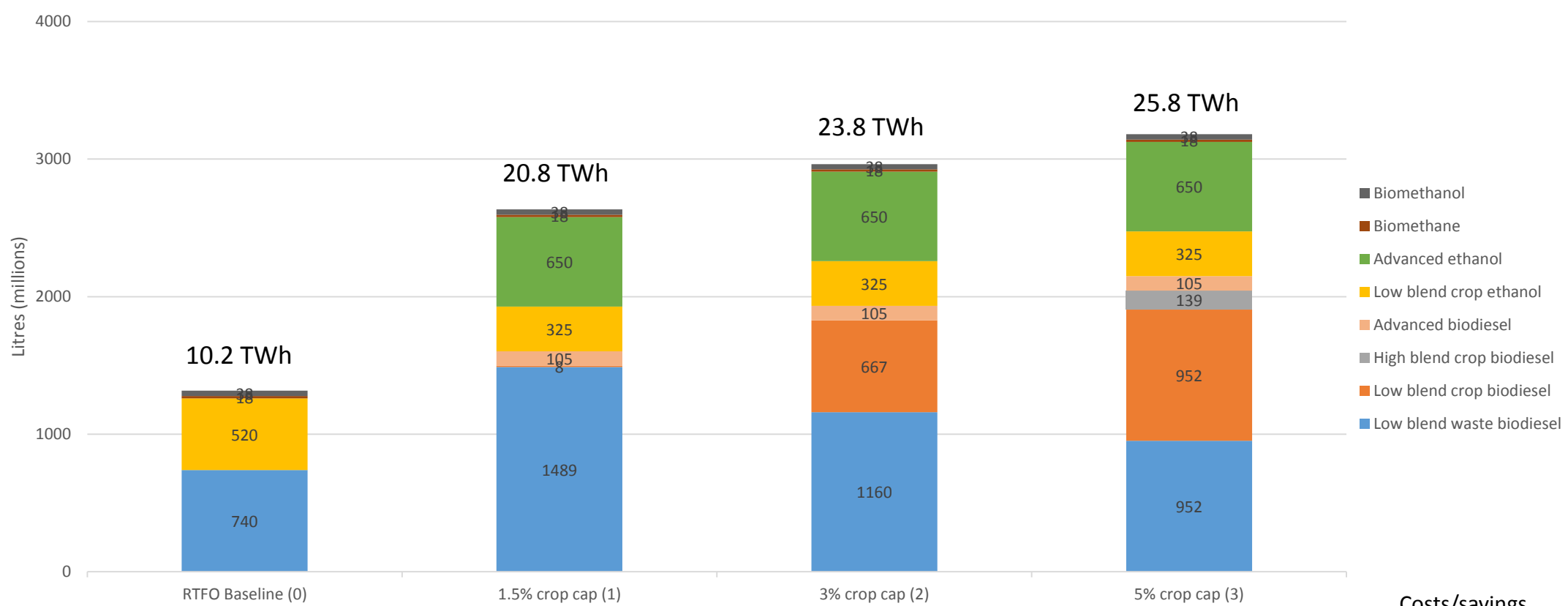
# E10 success, crop cap reduction



By reducing the crop cap over time, this is avoided, with no adverse effect on crop ethanol.

**2030**  
**E10 SUCCESS,**  
**CROP CAP**  
**REDUCE:**

**2020**  
**SUPPLY**  
**MIX:**



**GHG SAVINGS**  
**(MTCO2e):**

**% TOTAL FUEL VOL:**

**CROP SHARE:**  
**(energy)**

**COSTS:**  
**(2014 £s)**

**PPL IMPACT:**  
**(2014 pence)**

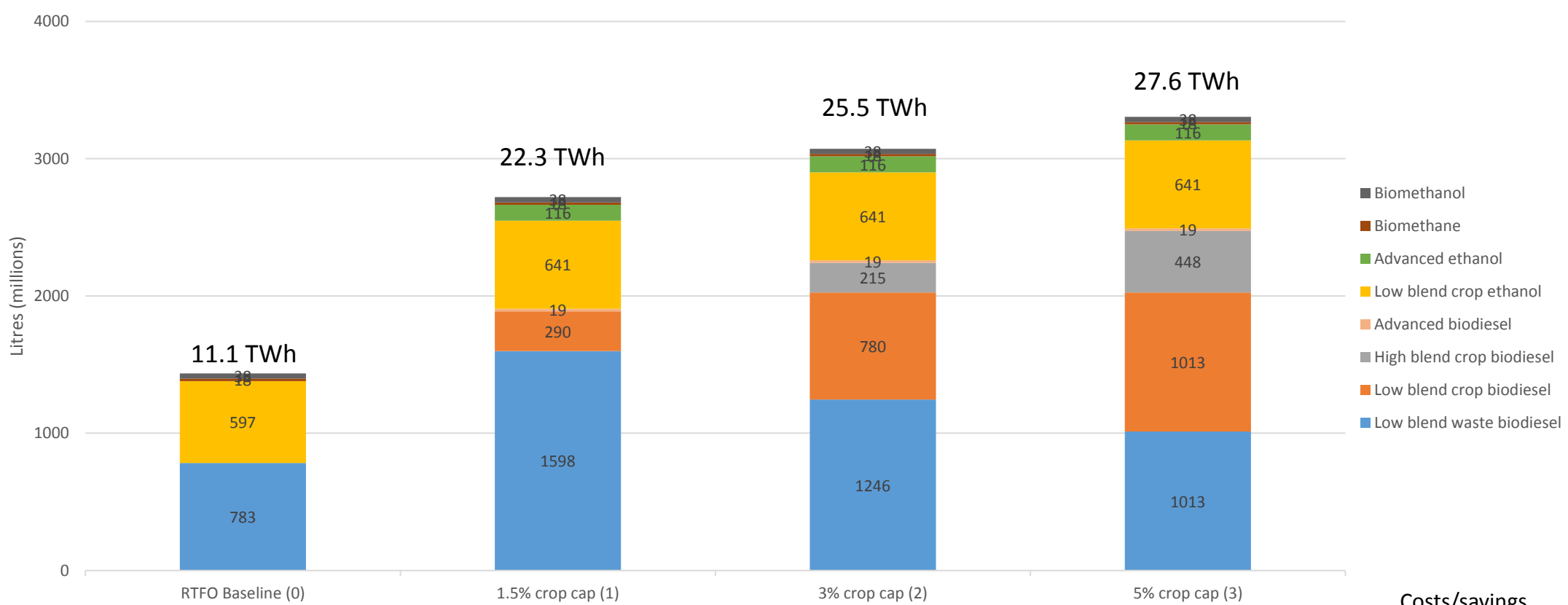
Scenario	RTFO Baseline (0)	1.5% crop cap (1)	3% crop cap (2)	5% crop cap (3)
GHG SAVINGS (MTCO2e):	2.3	+2.8	+2.1	+1.5
% TOTAL FUEL VOL:	3%	5.8%	6.5%	7%
CROP SHARE (energy):	0.7%	0.5%	2%	3%
COSTS (2014 £s):	255m/year 25/MWh 111/tCO2	+453m/year 43/MWh 159/tCO2	+423m/year 31/MWh 206/tCO2	+418m/year 27/MWh 270/tCO2
PPL IMPACT (2014 pence):	0.8	+1.4	+1.3	+1.2

Costs/savings above and beyond 'do nothing' scenario.

NB – advanced sub-target of 0.2% in 2020 for scenarios 1,2 and 3, rising to 1.2% in 2030. None in 0.

**2020  
E10 LIMITED:**

**2020  
SUPPLY  
MIX:**



**GHG SAVINGS  
(MTCO2e):**

**% TOTAL FUEL VOL:**

**CROP SHARE:  
(energy)**

**COSTS:  
(2014 £s)**

**PPL IMPACT:  
(2014 pence)**

Scenario	RTFO Baseline (0)	1.5% crop cap (1)	3% crop cap (2)	5% crop cap (3)
GHG SAVINGS (MTCO2e):	2.5	+2.1	+1.3	+0.7
% TOTAL FUEL VOL:	3%	5.6%	6.3%	6.8%
CROP SHARE (energy):	0.8%	1.5%	3%	4%
COSTS (2014 £s):	314m/year 28/MWh 127/tCO2	+391m/year 35/MWh 182/tCO2	+411m/year 29/MWh 318/tCO2	+402m/year 24/MWh 552/tCO2
PPL IMPACT (2014 pence):	0.9	+1.1	+1.1	+1.3

Costs/savings above and beyond 'do nothing' scenario.

NB – advanced sub-target of 0.2% in 2020 for scenarios 1,2 and 3, rising to 1.2% in 2030. None in 0.

# Assumptions and clarifications

- E10 takeup is 66% in a 'success' scenario (effective E8.3), 15% in a 'limited' scenario (effective
- E10 is introduced in 2017.
- The RTFO and an advanced sub-target are increased linearly over 2017-20.
- 'Crop cap reduction' scenarios reduce the crop cap by 0.1% a year after 2020.
- All CO2 calculations include ILUC.
- Any crop cap will likely be implemented on a volumetric, not an energy, basis.



# Conclusions

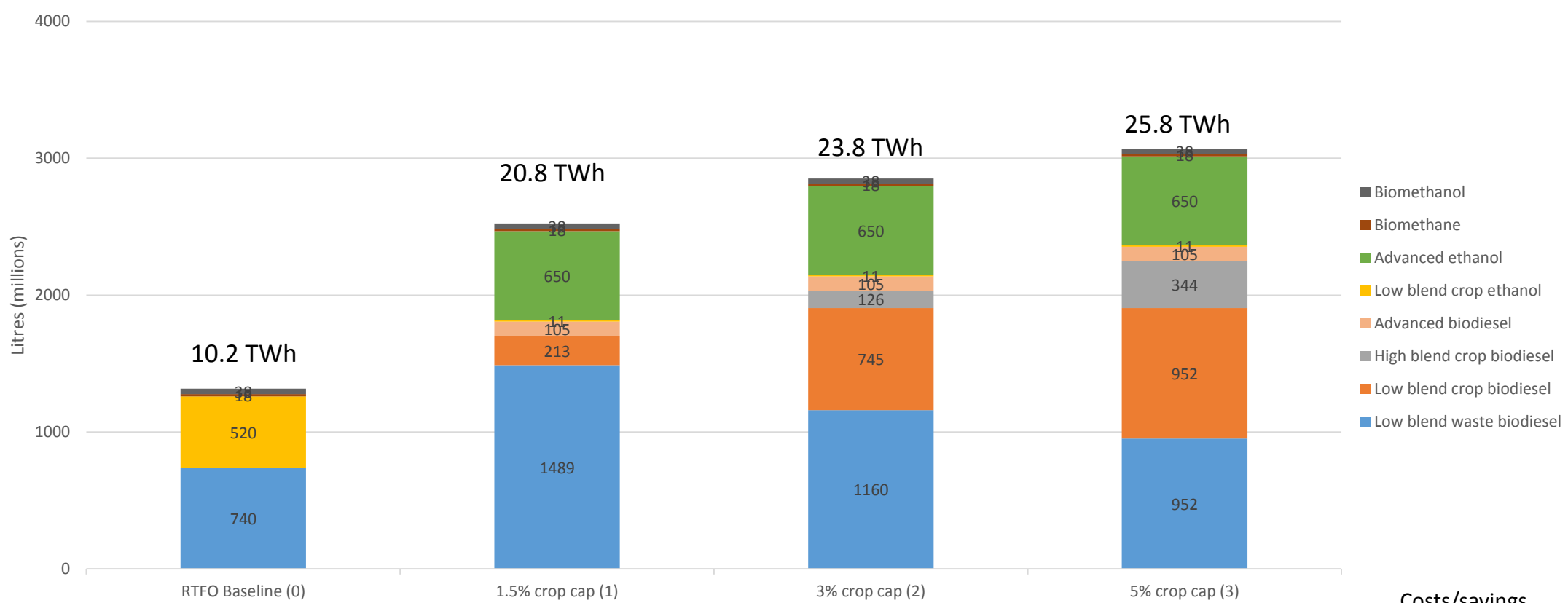
- From a carbon cost effectiveness perspective, a 1.5% crop cap (by energy) combined with E10 introduction appears most desirable.
- Crop caps, even at a low level, are unlikely to constrain ethanol.
- Further reductions post-2020 will constrain crop biodiesel without adverse effect on ethanol.
- Effective achievement of the RED will require a comprehensive communications campaign on E10 to avoid replicating Germany's experience.

# Appendix

The analysis carried out created more data than could be effectively presented. This is attached below for information.

**2030  
E10 LIMITED,  
CROP CAP  
REDUCE:**

**2020  
SUPPLY  
MIX:**



**GHG SAVINGS  
(MTCO2e):**

**% TOTAL FUEL VOL:**

**CROP SHARE:  
(energy)**

**COSTS:  
(2014 £s)**

**PPL IMPACT:  
(2014 pence)**

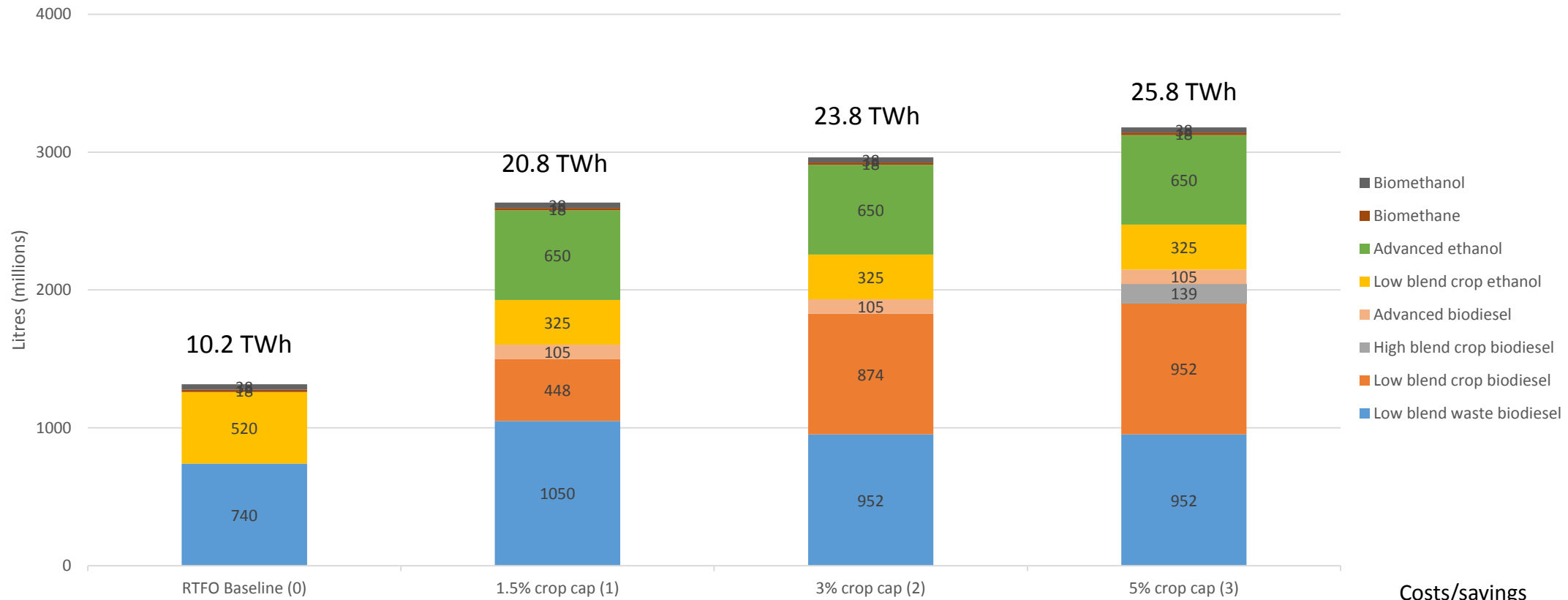
2.3	+2.5	+1.7	+1.2
3%	5.6%	6.3%	6.8%
0.7%	0.5%	2%	3%
255m/year 25/MWh 111/tCO2	+445m/year 42/MWh 176/tCO2	+426m/year 31/MWh 246/tCO2	+428m/year 28/MWh 348/tCO2
0.8	+1.3	+1.3	+1.3

Costs/savings above and beyond 'do nothing' scenario.

NB – advanced sub-target of 0.2% in 2020 for scenarios 1,2 and 3, rising to 1.2% in 2030. None in 0.

**2030**  
**E10 SUCCESS,**  
**CROP CAP**  
**MAINTAIN:**

**2020**  
**SUPPLY**  
**MIX:**



**GHG SAVINGS**  
**(MTCO2e):**

**% TOTAL FUEL VOL:**

**CROP SHARE:**  
**(energy)**

**COSTS:**  
**(2014 £s)**

**PPL IMPACT:**  
**(2014 pence)**

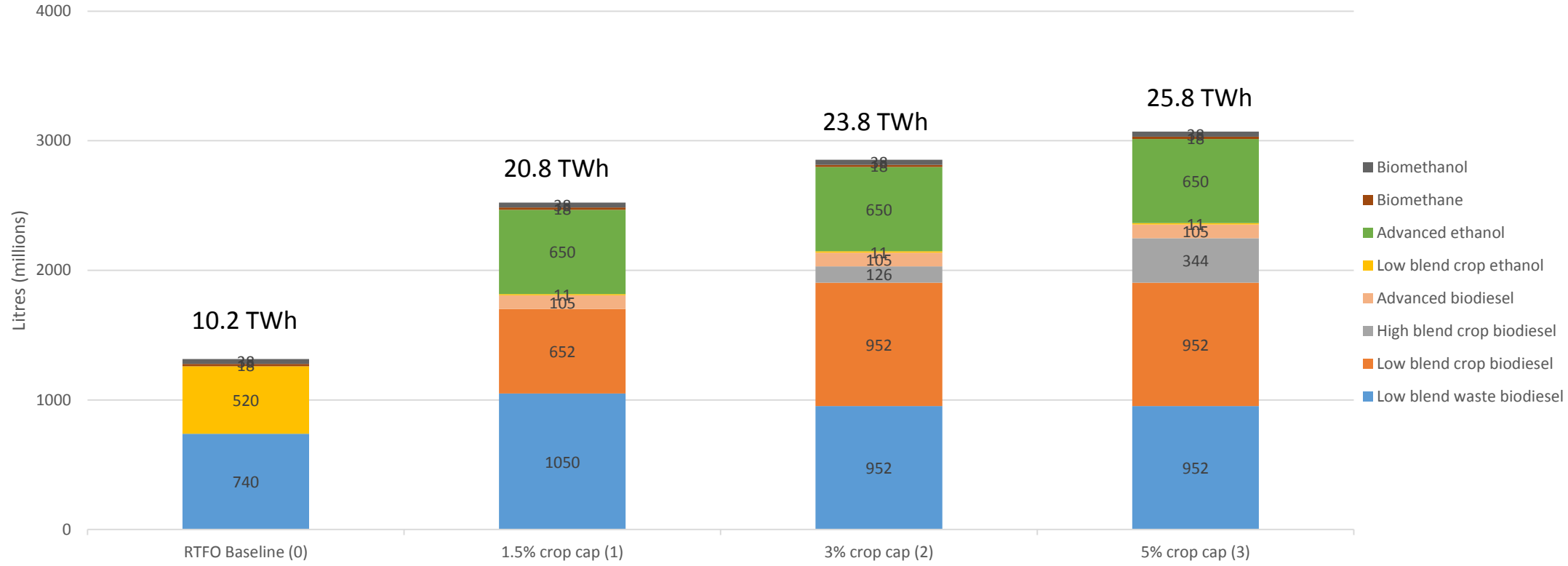
Scenario	RTFO Baseline (0)	1.5% crop cap (1)	3% crop cap (2)	5% crop cap (3)
GHG SAVINGS (MTCO2e):	2.3	+1.8	+1.6	+1.5
% TOTAL FUEL VOL:	3%	5.8%	6.5%	7%
CROP SHARE (energy):	0.7%	1.5%	2.5%	3%
COSTS (2014 £s):	255m/year 25/MWh 111/tCO2	+374m/year 35/MWh 207/tCO2	+386m/year 28/MWh 247/tCO2	+418m/year 27/MWh 270/tCO2
PPL IMPACT (2014 pence):	0.8	+1.1	+1.1	+1.2

Costs/savings above and beyond 'do nothing' scenario.

NB – advanced sub-target of 0.2% in 2020 for scenarios 1,2 and 3, rising to 1.2% in 2030. None in 0.

**2030**  
**E10 LIMITED,**  
**CROP CAP**  
**MAINTAIN:**

**2020**  
**SUPPLY**  
**MIX:**



**GHG SAVINGS**  
**(MTCO2e):**

**% TOTAL FUEL VOL:**

**CROP SHARE:**  
**(energy)**

**COSTS:**  
**(2014 £s)**

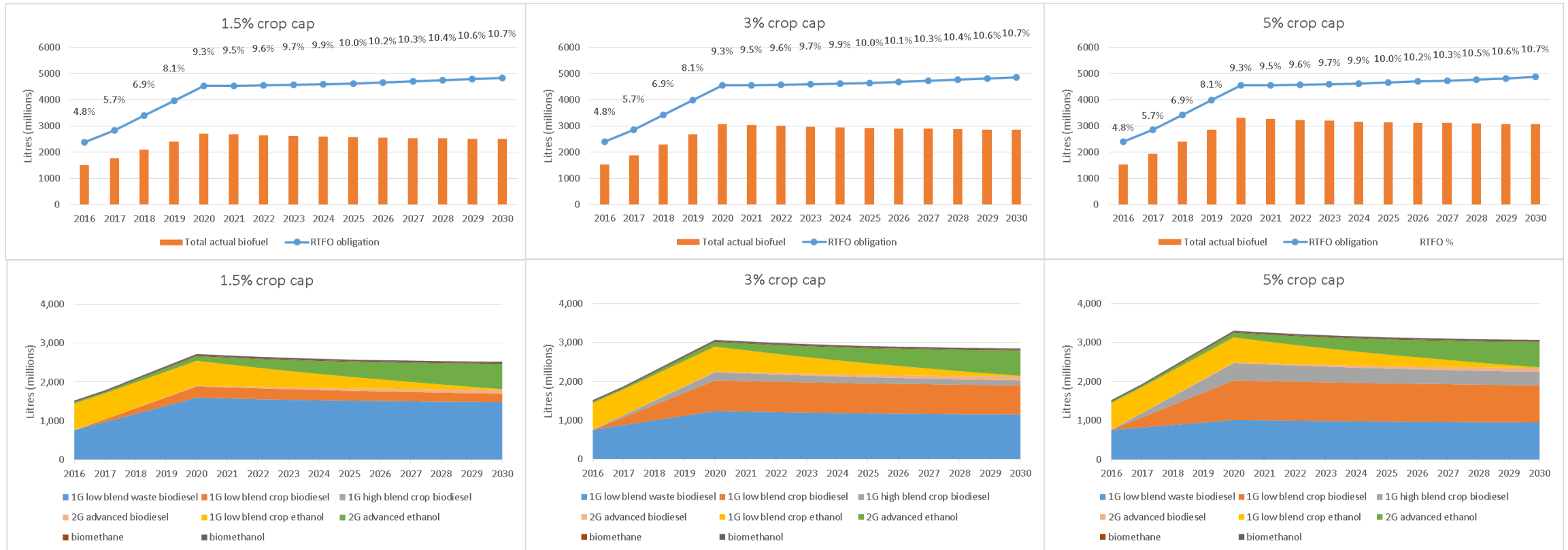
**PPL IMPACT:**  
**(2014 pence)**

Scenario	RTFO Baseline (0)	1.5% crop cap (1)	3% crop cap (2)	5% crop cap (3)
GHG SAVINGS (MTCO2e):	2.3	+1.5	+1.2	+1.2
% TOTAL FUEL VOL:	3%	5.6%	6.3%	6.8%
CROP SHARE (energy):	0.7%	1.5%	2.5%	3%
COSTS (2014 £s)	255m/year 25/MWh 111/tCO2	+365m/year 35/MWh 245/tCO2	+389m/year 29/MWh 313/tCO2	+428m/year 28/MWh 348/tCO2
PPL IMPACT (2014 pence)	0.8	+1.1	+1.2	+1.3

Costs/savings above and beyond 'do nothing' scenario.

NB – advanced sub-target of 0.2% in 2020 for scenarios 1,2 and 3, rising to 1.2% in 2030. None in 0.

# E10 limited, crop cap reduction



# E10 limited, crop cap maintained

