	A	В	С	D	E	F	G	Н		J	K	L
1												
2												
3	Why ir	nvest i	n gas?	Benef	its of r	natural	gas in	frastruc	cture fo	or the N	lorth W	/est
4												
5	WDC Polic	cy Briefing	no. 5									
6												
1	This file co	intains the s	source data	and calcula	ations for th	e estimate	s and figure	s in the Polic	cy Briefing			
8	lf you hove			ntaat halan	mahannu@	wdo io						
9	n you nave	any quene	es please co	mact neien	Inchenry@	wac.ie						
11	•											
12	Contents											
13	Formulae	Carbon Cha	arge (2)									
14	Carbon Ch	arge (3)	0 ()									
15	Fuel Cost	Save Form	ulae (4)									
16	Fuel Cost	Save (5)										
17	Tables Em	issions Bth	(6)									
18	I&C Carbo	n Emission	Saving (7)									
19	Domestic (8)										
20	Est Demar	nd I&C Dom	n (9)									
21	Domestic (Carbon Em	ission (10)									
22												

	A	В	C	D	E	F
	To calculate the amount of Carbon Charge pai	id in 11 North Weste	rn Towns compared to that which would be paid if	using natural gas (Policy	Briefing page	
1	10)					
2	Calcuations for both I/C and Domestic					
3	Data an fuel use by 1/C users is taken from Work	about on final cost on	in so patimata			
4		sheet on fuel cost sav	ings estimate.			
	This combined data for all I/C users (large with me	edium and small) to e	stimate percentage rate of change from different fuel ty	pes (see fuel cost workshe	et for full	
5	explanation).					
6		1			-	
/		MFO	Gas oil	Electricity	Check	
	All I/C (proportions of estimated load and					
8	proportions of fuel types combined.	0.69260124940537	0.242584554123585	0.064814196471045	1	
9		•	·		-	
10	To calculate carbon charge payable total estimate	ed load for 11 North W	est Towns from Gaslink New Towns Analysis Phase II	l is used.		
11						
12	Conversion of carbon charges as given in Fina	ance Act into carbon	i charge in € per MWh			
13	Pates used in this calculation are from Schedule '	24 Einanco Act 2010				
14	The Act does not provide specify rates for all diffe	erent forms of fuel oil s	o it is assumed that Gas oil is the same rates as 'other	fuel oil'		
10						
16						
17	(as is indicated in table below which provided deta	ails for carbon charge	returns to revenue) and that MFO is the rate for 'fuel oi	I (as also in table from reve	enue.ie)	
18	Natural gas	Rate		_		
19	Rate €3.07 as stated in Finance Act **para 67	3.07	€/MWh			
20		1	1-			
21						
22	MFO	_				
23	Charge is €45.95 per 1,000 litres (Finance Act 20	10 Schedule 2A) whic	h is 4595c per 1,000			
24	INCV^ (Net Calorific Value (I.e. now many KVVh of	energy from a litre) of	HEOM IS 10.786 KWN per litre or 10,786 KWN per 1,00			
25	Therefore carbon charge (c/kWh) is 4595/10786	=4595/10786	c/kWh			
26	Converting to € per MWh	=B25*1000/100	€/MWh			
27						
28	Gas OII Charge is £41.30 per 1.000 litres (Einance Act 20	10 Schodulo 2A) whic	h is 1130c per 1 000			
30	NCV^ (Net Calorific Value (i.e. how many kWh of	energy from a litre) of	Gas Oil is 10 169 kWh per litre or 10 169 kWh per 1 0	00 litres		
31	Therefore carbon charge (c/kWh) is 4130/10169	=4130/10169	c/kWh			
32	Converting to € per MWh	=B31*1000/100	€/MWh			
33						

	A	В	С	D	E F
34	Kerosene		·		<u> </u>
35	Charge is €38.02 per 1,000 litres (Finance Act 20	10 Schedule 2A) whic	h is 3802c per 1,000		
36	NCV [^] (Net Calorific Value (i.e. how many kWh of	energy from a litre) of	Kerosene 9.821 kWh per litre or 9,821 kWh per 1,000	itres	
				1	
37	Therefore carbon charge is 3802/9821	=3802/9821	c/kWh		
				1	
38	Converting to € per MWh	=B37*1000/100	€/MWh		
39					
40	LPG				
41	Charge is €24.64 per 1,000 litres Finance Act 201	0 which is 2464c per	1,000 litres		
42	NCV [^] (Net Calorific Value (i.e. how many kWh of	energy from a litre) of	LPG is 6.84 kWh per litre or 6840 kWh per 1,000 litres	-	
43	Therefore carbon charge is 2464/6840	=2464/6840	c/kWh	-	
44	Converting to € per MWh	=B43*1000/100	€/MWh	J	
45					
46	^ NCV from SEAI See below (end of worksheet)				
47	MNCV not given for MEO_HEO rate assumed				
48					
			1		
49	Carbon charge rates (€ per MWh)	€ per MWh			
50	Natural gas	=B19			
51	MFO	=B26			
52	Gas oil	=B32			
53	Electricity*	0			
54	Distillate (Kerosene)	=B38			
55	Peat**	0			
56	Coal**	0			
57	LPG	3.6			
58					
59	* No carbon charge				
00	**				
60	arcarbon charge not yet introduced. Currently no	carbon charge			
01					D:00
	Town	Estimated	Carbon tax payable if fuels used in proportions	Carbon tax payable if	Difference €
		Industrial and	above €	natural gas were used	for one year
		Commercial		€	
		Annual			
62		Consumption in			
62		570601		R63*\$B\$50	-C63-D63
64		010001	-(רמט שרשה שרשבר)+(רמט שרשם שרשה כיסר)+(רמט שרשה שרשה)	-000 00000	-005-005
65	If I/C users were able to switch to natural gas ther	the overall carbon of	parae navable by I/C users would be $\neq 4.94.032$ less than	currently	
88			ange payable by 10 acro would be ctot,002 1655 [[]al	louronuy	
66				lounonay	

	A	В	C	D	E	F
67						
68	DOMESTIC/RESIDENTIAL					
69	Residental users expected to switch to natural	gas from fuels in pe	ercentages below			٦
70	Desidential	Distillates		Electricity	Peat	-
71	Residential	0.7	0.1	0.1	0.1	-
72]
15	Томп	New Housing Load	Carbon tax payable if fuels used in proportions above	Carbon tax navable if	Difference E	1
	Town	(Forecast Summary		natural das were used €	for one year	
		vear 10) (MWh)			ion onlo your	
		<i>year rey</i> (<i>y</i>				
74						
75	TOTAL	139447	=(B75*B71*B54)+(B75*C71*B56)+(B75*D71*B53)+(B75*E71*B55)	428102.29	=C75-D75	
76						
	If Domestic users were able to switch to natural ga	as then the overall car	bon charge payable bynew domestic connections users	would be €50,214 less th	an currently	
77	paid (as carbon charges not on coal, peat or elect	ricity)				
79						
80	Overall in the 11 NW towns if both I/C users and	Domestic users could	switch to natural gas the amount of carbon tax payable	would be less	=E63+E75	
81	NT /					
82	Notes					
00						
84	What net calorific values do you use?	-		-		
85		toe/tonne	kWh/litre			
86	Kerosene	1.0556	9.821			
87	Crude Oil	1.0226	11.146			
88	Gasoline(Petrol)	1.065	9.348			
89	Diesel /Gasoil	1.0344	10.169	4		
90	Heavy Fuel Oil	0.9849	10.786	4		
91	LPG	1.1263	[6.84 [6.112	-		
92	Biodiesel	0.8901	19.113 IF 96F	-		
93	Bioethanol	0.0304		-		
94	Pure Plant Oli	0.8907	9.53			
90	Source: http://www.coniic/Dublications/Statistics	Publications/Statistic	a EAO/data and data manipulation EAO/#\//bat act	oplorifia		
96	Source: http://www.seai.ie/Publications/Statistics_	_rublications/Statistic	s_rAw/uata_anu_uata_manipulation_rAw/#what_het_	caloffic		
97						
98	Rates used in this calculation are from Schedule 2	A Finance Act 2010				
	The Act does not provide specify rates for all differ	rent forms of fuel oil so	o it is assumed that Gas oil is the same rates as 'other f	uel oil' (as is indicated in ta	able below	
99	which provided details for carbon charge returns to	o revenue) and that M	FO is the rate for 'fuel oil (as also in table from revenue	.ie).		

		A	В	С		D	E	F
100 101 102	3	The rates of Carbon Cha	rge applicable	e from 01/05/2010 are	as follows:			
103 104		Descrip	tion of Miner	ral Oil	Rat	e		
105		Marked Gas Oil			€0.0413 per	litre		
106		Marked kerosene			€0.03802 per	r litre		
107		Fuel oil			€0.04595 per	r litre		
109		LPG			€0.02464 per	r litre		
110 111 112		L			1			

	-
Description of Mineral Oil	Rate
Marked Gas Oil	€0.0413 per litre
Marked kerosene	€0.03802 per litre
Fuel oil	€0.04595 per litre
LPG	€0.02464 per litre

The rates of Carbon Charge applicable from 01/05/2010 are as follows:

Description of Mineral Oil	Rate
Marked Gas Oil	€0.0413 per litre
Marked kerosene	€0.03802 per litre
Fuel oil	€0.04595 per litre
LPG	€0.02464 per litre

	A	В	С	D	E
	To calculate the amount of Carbon Charge	paid in 11 North Western To	wns compared to that	which would be p	aid if using natural
1	gas (Policy Briefing page 10)				
2	Calcuations for both I/C and Domestic				
3					
4	Data on fuel use by I/C users is taken from W	ork sheet on fuel cost savings	estimate.		
	This combined data for all I/C users (large wit	h medium and small) to estima	te percentage rate of ch	ange from different	fuel types (see fuel
5	cost worksheet for full explanation).		· •	-	
6					
7		MFO	Gas oil	Electricity	check
	All I/C (proportions of estimated load and				
8	proportions of fuel types combined	69.3%	24.3%	6.5%	100.0%
9					
10	To calculate carbon charge payable total estir	mated load for 11 North West T	owns from Gaslink New	I Towns Analysis Pl	hase III is used
11					
12	Conversion of carbon charges as given in	Finance Act into carbon chai	rge in € per MWh.		
13					
14	Rates used in this calculation are from Sched	ule 2A Finance Act 2010.			
15	The Act does not provide specify rates for all	different forms of fuel oil so it is	s assumed that Gas oil i	s the same rates as	s other fuel oil
16	(as is indicated in table below which provided	details for carbon charge retur	ns to revenue) and that	MFO is the rate for	'fuel oil (as also in
17	table from revenue ie)	details for carbon charge retai			
18					
19	Natural gas	Rate		1	
20	Rate €3.07 as stated in Finance Act **para 67	3.07	€/MWh		
21	· · · ·			3	
22	MFO				
23	Charge is €45.95 per 1,000 litres (Finance Ac	t 2010 Schedule 2A) which is 4	595c per 1,000		
24	NCV [^] (Net Calorific Value (i.e. how many kW	h of energy from a litre) of HFC)^^ is 10.786 kWh per lit	re or 10,786 kWh p	er 1,000 litres
25	Therefore carbon charge (c/kWh) is 4595/107	0.426	c/kWh		
26	Converting to € per MWh	4.26	€/MWh		
27					
28	Gas Oil				
29	Charge is €41.30 per 1,000 litres (Finance Ac	t 2010 Schedule 2A) which is 4	130c per 1,000		
30	NCV [^] (Net Calorific Value (i.e. how many kW	h of energy from a litre) of Gas	Oil is 10.169 kWh per li	tre or 10,169 kWh j	per 1,000 litres
31	Therefore carbon charge (c/kWh) is 4130/101	0.406	c/kWh		
32	Converting to € per MWh	4.06	€/MWh		
33					
34					
35	Charge is €38.02 per 1,000 litres (Finance Ac	t 2010 Schedule 2A) which is 3	8802c per 1,000	0.004 1.14/	4.000 //
36	INCV^ (Net Calorific Value (i.e. how many kW	n of energy from a litre) of Kerc	osene 9.821 kvvh per litr	e or 9,821 kWh per	1,000 litres
3/	Therefore earlier shares is 0000/0004	0.007		1	
38	Inererore carbon charge is 3802/9821	0.387		4	
39		3.87	E/IVIVIN	J	
40					

	A	В	C	D	E
41	LPG				
42	Charge is €24.64 per 1,000 litres Finance Act	2010 which is 2464c per 1,000) litres		
43	NCV [^] (Net Calorific Value (i.e. how many kW	h of energy from a litre) of LPG	is 6.84 kWh per litre or	6840 kWh per 1,00	00 litres
44				_	
45	Therefore carbon charge is 2464/6840	0.360	c/kWh		
46	Converting to € per MWh	3.60	€/MWh		
47					
48	^ NCV from SEAI See below (end of workshe	et)			
49	^NCV not given for MFO. HFO rate assume	d.			
50			•		
51	Carbon charge rates (€ per MWh)	€ per MWh			
52	Natural gas	3.07			
53	MFO	4.26			
54	Gas oil	4.06			
55	Electricity*	0	4		
56	Distillate (Kerosene)	3.87			
57	Peat**	0			
58	Coal**	0			
59	LPG	3.6			
60	* No carbon charge				
61	**carbon charge not yet introduced. Currently	no carbon charge			
62					
	Town	Estimated Industrial and	Carbon tax payable if	Carbon tax	Difference € for one
		Commercial Annual	fuels used in	payable if natural	year
62		Consumption in year 7(MWh)	proportions above €	gas were used €	
03		530.001	CO 045 777		6404.022
64		570,601	€2,245,777	€1,751,745	€494,032
60	If I/C uppers were able to switch to natural app	then the overall earbon charge	noveble by UC years w	ould be E404 022 le	as then surrently
67	In the users were able to switch to hatural gas	then the overall carbon charge	payable by I/C users w	0uiu de €494,032 ie	ess than currently
69					
60	Domesho/Residential	ural das from fuels in percer	tages below		
70		Distillates	Coal	Electricity	Peat
71	Residential	70%	10%	10%	10%
72		10,0	1070	1070	1070
	Town	New Housing Load (Forecast	Carbon tax payable if	Carbon tax	Difference € for one
		Summary, year 10) (MWb)	fuels used in	pavable if natural	vear
73			proportions above €	payable in nataran gas were used €	your
74	ΤΟΤΑΙ	139,447	€377 888	€428 102	<i>-</i> €50 214
75		,		0.20,.02	
<u> </u>	If Domestic users were able to switch to natur	al gas then the overall carbon	charge payable bynew o	lomestic connectior	ns users would be
76	€50,214 less than currently paid (as carbon cl	harges not on coal, peat or elec	ctricity)		
	(though as noted elsewhere actual fuel saving	as are higher)			
11		,			
78					

		А	В		С	D	E
	Overall in	the 11 NW towns if both I/C users	and Domestic users could swit	ch to natura	al gas the amo	ount of carbon tax	
79	payable w	ould be less					€443,819
80							
81	Notes						
82	1						
83	1						
84	1						
85	What net	calorific values do you use?					
86		-	toe/tonne	kWh/litre			
87	Kerosene		1.0556	9.821			
88	Crude Oil		1.0226	11.146			
89	Gasoline(Petrol)	1.065	9.348			
90	Diesel /Ga	asoil	1.0344	10.169			
91	Heavy Fu	el Oil	0.9849	10.786			
92	LPG		1.1263	6.84			
93	Biodiesel		0.8901	9.113			
94	Bioethanc	bl	0.6304	5.865			
95	Pure Plan	t Oil	0.8907	9.53			
96							
07	Source: h	http://www.seai.ie/Publications/Statis	tics_Publications/Statistics_FA	Q/data_an	d_data_manip	oulation_FAQ/#Wha	t_net_calorific
97	Detection	dia this coloulation are from Coloud	ula 24 Finance Act 2010				
98	Rates use	ed in this calculation are from Sched	ule 2A Finance Act 2010.				
	The Act d	oes not provide specify rates for all	different forms of fuel oil so it is	sassumed	that Gas oil is	the same rates as	other fuel oil' (as is
	indicated	in table below which provided detail	s for carbon charge returns to i	evenue) ar	nd that MFO is	s the rate for 'fuel oil	(as also in table
99	from reve	nue.ie).					
100	3 1	The rates of Carbon Charge	applicable from 01/05/2	2010 are	as follows		
101		-					
102	.						1
103	.	Description	n of Mineral Oil			Rate	
104	.						
105	.	Marked Gas Oil			€0.0413 p	oer litre	
106	.						
107	.	Marked kerosene			€0.03802	per litre	
108	.					F	
109	.	Fuel oil			£0.04505	nor litro	
110	.				20.04595	per nue	
111	.	1.00			co. 00.40.4		
112	.	LPG			€0.02464	per litre	
113	. I						
114	l						
115	Source: v	www.revenue.ie/en/tax/excise/forms/	/refund-mineral-oil-tax-carbon-o	harge.pdf			

	Α	В	С	D	E	F	G H
1	Fuel cost savings for I/C users	in 11 towns, *Large a	nd Small and medium u	users			
2	(Policy Briefing page 7)						
3							
4	To estimate fuel to be switched f	rom Gas to the North W	est* study used. Percen	ntage estimates given in I	report Appendix (3	
5	*Fingleton White et al., 2007, Gas to	o the Northwest Feasibility	Study commissioned by D	OCMNR.			
6							
7	Assumptions that 'fuel oil' is Med per annum). Natural gas rate Bar	ium Fuel Oil (MFO), that nd I2 >=1000<10,000 G	Distillates are Gas oil; th J per annum	hat the electricity rate pay	yable is SEAI me	dium band (for 50	00-2000 MWh
8	Prices for MFO and Gas oil and I	Electricity from SEAI Fue	el cost comparison Com	mercial/ Industrial Fuels	Comparison of E	nergy Costs 01 J	uly 2011
9							
10	To estimate fuel to be switched f	rom (from Gas to the NV	V study). Percentage es	timates given in report Ap	opendix G		
11							
12	Users expected to switch to na	atural gas from fuels in	percentages below		1		
13		MFO	Gas oli	Electricity	-		
14	Large I/C users	0.9	0.05	0.05			
<u> </u>		0.0	0.00	0.00	1		
15	Medium & Small users	0.2	0.7	0.1	-		
17					J		
18	Then to Estimate proportion of La	arge and Small and Med	ïum users.				
19		•					
	Gaslink New towns analysis give	s total estimated load for	r each town. However w	hile it lists the number of	large users it do	es not give inform	nation of size of
	large loads. It was therefore nec	essary to use the figures	s from the Gas to the NW	/ study to estiamte propo	ortion of load which	ch could be categ	orised as large
	(and small and medium). The re	port gave potential loads	s estimated for Large, Me	edium and Small I/C for t	wo different route	options. Route	A included
0	Castlebar, Route C Included Ball	ynaunis, Claremorris and	b Ballagnaderreen. An a	verage of the two routes	was taken to giv	e an estimate of	the proportion
20	of the load which can be conside	red Large 1/C and that w					
21					1		г —
							Combining
22		Route A (k therms)	%	Route C (k therms)	%	Average%	M&S I/C
23	Large I/C	3967	=B23/\$B\$26	7679	=D23/\$D\$26	=(C23+E23)/2	=F23
24	Medium I/C	880	=B24/\$B\$26	846	=D24/\$D\$26	=(C24+E24)/2	=F24+F25
25	Small I/C		=B25/\$B\$26		=D25/\$D\$26	=(C25+E25)/2	
26	lotal	=SUM(B23:B25)	=826/\$8\$26	=SUM(D23:D25)	=D26/\$D\$26	=(C26+E26)/2	
20						I	
20							
29	Then combine data for all I/C use	ers (large with medium a	nd small) to estimate per	centage rate of change f	from different fue	types.	
30		1		1	T	-	
31		MFO	Gas oil	Electricity	check	<u> </u>	
	All I/C (proportions of estimated						
	load and proportions of fuel						
32	types combined	=(B14*\$G\$23)+(B15*\$G\$24)	=(C14*\$G\$23)+(C15*\$G\$24)	=(D14*\$G\$23)+(D15*\$G\$24)	=B32+C32+D32		

	Α	В	С	D	E	F	G H
33							
34	To Calculate Fuel Cost savings to	otal estimated load for 1	1 North West Towns from	n Gaslink New Towns Ar	nalysis Phase III is	used.	
	Town	Estimated Industrial					
		and Commercial					
0.5		Annual Consumption					
35		in year 7 (MWh)	-				
36	Ballyshannon	9588	-				
37	Bundoran	10349	4				
38	Donegal	43934	4				
39	Lifford	4650	4				
40	Letterkenny	50969					
41	Sligo	70379					
42	Boyle	6310					
43	Carrick on Shannon	248744					
44	Roscommon	32820	1				
45	Strokestown	4407					
46	Ballaghaderreen	88451					
47	TOTAL	=SUM(B36:B46)					
48							
49		MFO	Gas Oil	Electricity*	Natural gas^		
	Price c/kWh (SEAI I/C fuel						
50	comparison July 2011)	8.09	9.16	12.75	4.25		
51							
52	To Estimate fuel cost savings	if switch to natural ga	S				
52	To Estimate fuel cost savings	if switch to natural ga I	s				Diff between
52	To Estimate fuel cost savings	if switch to natural ga	s				Diff between cost of natl gas
52	To Estimate fuel cost savings	if switch to natural ga	s		Total for 3		Diff between cost of natl gas & alternative
52 53	To Estimate fuel cost savings	if switch to natural ga	Gas Oil	Electricity*	Total for 3 fuels	Natural gas*	Diff between cost of natl gas & alternative fuels
52 53	To Estimate fuel cost savings Fuel Cost Savings Proportion of load for each fuel	if switch to natural ga MFO	Gas Oil	Electricity*	Total for 3 fuels	Natural gas*	Diff between cost of natl gas & alternative fuels
52 53 54	To Estimate fuel cost savings Fuel Cost Savings Proportion of load for each fuel MWh	if switch to natural ga MFO =B47*B32	Gas Oil =B47*C32	Electricity* =B47*D32	Total for 3 fuels	Natural gas* =B54+C54+D54	Diff between cost of natl gas & alternative fuels
52 53 54	Fuel Cost Savings Fuel Cost Savings Proportion of load for each fuel MWh Price c/kWh (SEAI I/C fuel	if switch to natural ga MFO =B47*B32	Gas Oil =B47*C32	Electricity* =B47*D32	Total for 3 fuels	Natural gas* =B54+C54+D54	Diff between cost of natl gas & alternative fuels
52 53 54 55	To Estimate fuel cost savings Fuel Cost Savings Proportion of load for each fuel MWh Price c/kWh (SEAI I/C fuel comparison July 2011) less	if switch to natural ga MFO =B47*B32 =B50*0.8	Gas Oil =B47*C32 =C50*0.8	Electricity* =B47*D32 =D50	Total for 3 fuels	Natural gas* =B54+C54+D54 =E50	Diff between cost of natl gas & alternative fuels
52 53 54 55 56	To Estimate fuel cost savings Fuel Cost Savings Proportion of load for each fuel MWh Price c/kWh (SEAI I/C fuel comparison July 2011) less Price €/MWh	if switch to natural ga MFO =B47*B32 =B50*0.8 =B55*1000/100	s Gas Oil =B47*C32 =C50*0.8 =C55*1000/100	Electricity* =B47*D32 =D50 =D55*1000/100	Total for 3 fuels	Natural gas* =B54+C54+D54 =E50 =F55*1000/100	Diff between cost of natl gas & alternative fuels
52 53 54 55 56 57	To Estimate fuel cost savings Fuel Cost Savings Proportion of load for each fuel MWh Price c/kWh (SEAI I/C fuel comparison July 2011) less Price €/MWh Cost of estimated load for mix of	if switch to natural ga MFO =B47*B32 =B50*0.8 =B55*1000/100	s Gas Oil =B47*C32 =C50*0.8 =C55*1000/100	Electricity* =B47*D32 =D50 =D55*1000/100	Total for 3 fuels	Natural gas* =B54+C54+D54 =E50 =F55*1000/100	Diff between cost of natl gas & alternative fuels
52 53 54 55 56 57 58	To Estimate fuel cost savings Fuel Cost Savings Proportion of load for each fuel MWh Price c/kWh (SEAI I/C fuel comparison July 2011) less Price €/MWh Cost of estimated load for mix of 3 fuels	MFO =B47*B32 =B50*0.8 =B55*1000/100 =B54*B56	Gas Oil =B47*C32 =C50*0.8 =C55*1000/100 =C54*C56	Electricity* =B47*D32 =D50 =D55*1000/100 =D54*D56	Total for 3 fuels =B58+C58+D58	Natural gas* =B54+C54+D54 =E50 =F55*1000/100 =F54*F56	Diff between cost of natl gas & alternative fuels =E58-F58
52 53 54 55 56 57 58 59	To Estimate fuel cost savings Fuel Cost Savings Proportion of load for each fuel MWh Price c/kWh (SEAI I/C fuel comparison July 2011) less Price €/MWh Cost of estimated load for mix of 3 fuels	if switch to natural ga MFO =B47*B32 =B50*0.8 =B55*1000/100 =B54*B56	Gas Oil =B47*C32 =C50*0.8 =C55*1000/100 =C54*C56	Electricity* =B47*D32 =D50 =D55*1000/100 =D54*D56	Total for 3 fuels =B58+C58+D58	Natural gas* =B54+C54+D54 =E50 =F55*1000/100 =F54*F56	Diff between cost of natl gas & alternative fuels =E58-F58
52 53 54 55 56 57 58 59 60	To Estimate fuel cost savings Fuel Cost Savings Proportion of load for each fuel MWh Price c/kWh (SEAI I/C fuel comparison July 2011) less Price €/MWh Cost of estimated load for mix of 3 fuels * Band IC =500	<pre>if switch to natural ga</pre>	s Gas Oil =B47*C32 =C50*0.8 =C55*1000/100 =C54*C56	Electricity* =B47*D32 =D50 =D55*1000/100 =D54*D56	Total for 3 fuels =B58+C58+D58	Natural gas* =B54+C54+D54 =E50 =F55*1000/100 =F54*F56	Diff between cost of natl gas & alternative fuels =E58-F58
52 53 54 55 56 57 58 59 60	To Estimate fuel cost savings Fuel Cost Savings Proportion of load for each fuel MWh Price c/kWh (SEAI I/C fuel comparison July 2011) less Price €/MWh Cost of estimated load for mix of 3 fuels * Band IC .=500<2000 MWh per	if switch to natural ga MFO =B47*B32 =B50*0.8 =B55*1000/100 =B54*B56	S Gas Oil =B47*C32 =C50*0.8 =C55*1000/100 =C54*C56	Electricity* =B47*D32 =D50 =D55*1000/100 =D54*D56	Total for 3 fuels =B58+C58+D58	Natural gas* =B54+C54+D54 =E50 =F55*1000/100 =F54*F56	Diff between cost of natl gas & alternative fuels =E58-F58
52 53 54 55 56 57 58 59 60 61	To Estimate fuel cost savings Fuel Cost Savings Proportion of load for each fuel MWh Price c/kWh (SEAI I/C fuel comparison July 2011) less Price €/MWh Cost of estimated load for mix of 3 fuels * Band IC .=500<2000 MWh per	if switch to natural ga MFO =B47*B32 =B50*0.8 =B55*1000/100 =B54*B56 annum el cost comparison Note	Gas Oil =B47*C32 =C50*0.8 =C55*1000/100 =C54*C56 2:'Rebate may reduce the second secon	Electricity* =B47*D32 =D50 =D55*1000/100 =D54*D56 he fuel cost in the region	Total for 3 fuels =B58+C58+D58 of 20-25% depen	Natural gas* =B54+C54+D54 =E50 =F55*1000/100 =F54*F56 ding on various i	Diff between cost of natl gas & alternative fuels =E58-F58
52 53 54 55 56 57 58 59 60 61 62	To Estimate fuel cost savings Fuel Cost Savings Proportion of load for each fuel MWh Price c/kWh (SEAI I/C fuel comparison July 2011) less Price €/MWh Cost of estimated load for mix of 3 fuels * Band IC .=500<2000 MWh per	MFO =B47*B32 =B50*0.8 =B55*1000/100 =B54*B56 rannum el cost comparison Note	Gas Oil =B47*C32 =C50*0.8 =C55*1000/100 =C54*C56 2:'Rebate may reduce the second secon	Electricity* =B47*D32 =D50 =D55*1000/100 =D54*D56 he fuel cost in the region	Total for 3 fuels =B58+C58+D58 of 20-25% depen	Natural gas* =B54+C54+D54 =E50 =F55*1000/100 =F54*F56 ding on various i	Diff between cost of natl gas & alternative fuels =E58-F58
52 53 54 55 56 57 58 59 60 61 62	To Estimate fuel cost savings Fuel Cost Savings Proportion of load for each fuel MWh Price c/kWh (SEAI I/C fuel comparison July 2011) less Price €/MWh Cost of estimated load for mix of 3 fuels * Band IC .=500<2000 MWh per	if switch to natural ga MFO =B47*B32 =B50*0.8 =B55*1000/100 =B54*B56 annum el cost comparison Note 0<10,000 GJ per annum	Gas Oil =B47*C32 =C50*0.8 =C55*1000/100 =C54*C56	Electricity* =B47*D32 =D50 =D55*1000/100 =D54*D56 he fuel cost in the region	Total for 3 fuels =B58+C58+D58 of 20-25% depen	Natural gas* =B54+C54+D54 =E50 =F55*1000/100 =F54*F56 ding on various r	Diff between cost of natl gas & alternative fuels =E58-F58

1 Fuel cost savings for UC users in 11 towns, "Large and Small and medium users 2 (Policy Briefing page 7) 3 4 7 estimate fuel to be switched from. Gas to the North West' study used. Percentage estimates given in report Appendix G 6 *Fingleton White et al., 2007, Gas to the Northwest Perusibility Study commissioned by DCMNR. 6 *Sumptions that 'fuel oil' is Medium Fuel Oil (MFO), that Distillates are Gas oil; that the electricity rate payable is SEAI medium band (for 500-2000 MWh per 7 annum). Natural gas rate Band 12 >=1000<10.000 GJ per annum 8 Prices for MFO and Gas oil and Electricity from SEAI Fuel cost comparison Commercial/ Industrial Fuels Comparison of Energy Costs 01 July 2011 10 To estimate fuel to be switched from (from Gas to the NW study). Percentage estimates given in report Appendix G 11 Large L/C users 00% 5% 5% 12 Users expected to switch to natural gas from fuels in percentages below 13 Large L/C users 00% 5% 5% 14 Large L/C users 00% 5% 15 Medium & Small and Medium users. 19 Gaslink New towns analysis gives total estimated load for each town. However while it lists the number of large users it does not give information of size of large loads. It was therefore necessary to use the figures from the Gas to the NW study to estimate proportion of load which could be categorised as l		Α	В	С	D	E	F	G	Н				
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16 17 17 Then to Estimate proportion of Large and Small and Medium users. 19 Gaslink New towns analysis gives total estimated load for each town. However while it lists the number of large users it does not give information of size of large loads. It was therefore necessary to use the figures from the Gas to the NW study to estimate proportion of load which could be categorised as large (and small and medium). The report gave potential loads estimated for Large, Medium and Small I/C for two different route options. Route A included Castlebar, Route C included Ballyhaunis, Claremorris and Ballaghaderreen. An average of the two routes was taken to give an estimate of the proportion of the load which can be considered Large I/C and that which can be considered Small and Medium I/C. 20 the load which can be considered Large I/C and that which can be considered Small and Medium I/C. 21 Route A (k therms) % 22 Route A (k therms) % 23 Large I/C 3,967 63% 7,679 77% 70% 70.4% 24 Medium I/C 880 14% 846 9% 11% 29.6% 26 Total 6,259 100% 9,926 100% 100% 29.6% 27 28 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30 Gas oil <th>15</th> <td>Medium & Small users</td> <td>20%</td> <td>70%</td> <td>10%</td> <td></td> <td></td> <td></td> <td></td>	15	Medium & Small users	20%	70%	10%								
17 Then to Estimate proportion of Large and Small and Medium users. 19 Gaslink New towns analysis gives total estimated load for each town. However while it lists the number of large users it does not give information of size of large loads. It was therefore necessary to use the figures from the Gas to the NW study to estimate proportion of load which could be categorised as large (and small and medium). The report gave potential loads estimated for Large, Medium and Small I/C for two different route options. Route A included Castlebar, Route C included Ballyhaunis, Claremorris and Ballaghaderreen. An average of the two routes was taken to give an estimate of the proportion of 20 the load which can be considered Large I/C and that which can be considered Small and Medium I/C. 21 Route A (k therms) % Average% I/C 22 Route A (k therms) % Average% I/C 23 Large I/C 3,967 63% 7,679 77% 70% 70.4% 24 Medium I/C 880 14% 846 9% 11% 29.6% 26 Total 6,259 100% 9,926 100% 100% 29.6% 27 Z8 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30 Average from different fuel types.	16												
18 Then to Estimate proportion of Large and Small and Medium users. 19 Gaslink New towns analysis gives total estimated load for each town. However while it lists the number of large users it does not give information of size of large loads. It was therefore necessary to use the figures from the Gas to the NW study to estimate proportion of load which could be categorised as large (and small and medium). The report gave potential loads estimated for Large, Medium and Small I/C for two different route options. Route A included Castlebar, Route C included Ballyhaunis, Claremorris and Ballaghaderreen. An average of the two routes was taken to give an estimate of the proportion of the load which can be considered Large I/C and that which can be considered Small and Medium I/C. 21 Route A (k therms) % Average% I/C 22 Route A (k therms) % Average% I/C 23 Large I/C 3,967 63% 7,679 77% 70% 70.4% 24 Medium I/C 880 14% 846 9% 11% 29.6% 25 Small I/C 1,412 23% 1,401 14% 18% 29.6% 26 Total 6,259 100% 9,926 100% 100% 29.6% 27 77 72 72% 1412 23% 1,401 14%	17												
19 Gaslink New towns analysis gives total estimated load for each town. However while it lists the number of large users it does not give information of size of large loads. It was therefore necessary to use the figures from the Gas to the NW study to estimate proportion of load which could be categorised as large (and small and medium). The report gave potential loads estimated for Large, Medium and Small I/C for two different route options. Route A included Castlebar, Route C included Ballyhaunis, Claremorris and Ballaghaderreen. An average of the two routes was taken to give an estimate of the proportion of the load which can be considered Large I/C and that which can be considered Small and Medium I/C. 21 22 Route A (k therms) % Average% Combining M&S 23 Large I/C 3,967 63% 7,679 77% 70% 70.4% 24 Medium I/C 880 14% 846 9% 11% 29.6% 26 Total 6,259 100% 9,926 100% 100% 29.6% 27 28 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30 MEO Gas oil Electricity check 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 10	18	Then to Estimate proportion of Large and Small and Medium users.											
Gaslink New towns analysis gives total estimated load for each town. However while it lists the number of large users it does not give information of size of large loads. It was therefore necessary to use the figures from the Gas to the NW study to estimate proportion of load which could be categorised as large (and small and medium). The report gave potential loads estimated for Large, Medium and Small I/C for two different route options. Route A included Castlebar, Route C included Ballyhaunis, Claremorris and Ballaghaderreen. An average of the two routes was taken to give an estimate of the proportion of the load which can be considered Large I/C and that which can be considered Small and Medium I/C. 21 Route A (k therms) % Average% Combining M&S 22 Route A (k therms) % Average% I/C 23 Large I/C 3,967 63% 7,679 77% 70% 70.4% 24 Medium I/C 880 14% 846 9% 11% 29.6% 26 Total 6,259 100% 9,926 100% 29.6% 27 28 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types.	19												
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Iarge loads. It was therefore necessary to use the figures from the Gas to the NW study to estimate proportion of load which could be categorised as large (and small and medium). The report gave potential loads estimated for Large, Medium and Small I/C for two different route options. Route A included Castlebar, Route C included Ballyhaunis, Claremorris and Ballaghaderreen. An average of the two routes was taken to give an estimate of the proportion of the load which can be considered Large I/C and that which can be considered Small and Medium I/C. 20 the load which can be considered Large I/C and that which can be considered Small and Medium I/C. 21 22 Route A (k therms) % Average% I/C 23 Large I/C 3,967 63% 7,679 77% 70% 70.4% 24 Medium I/C 880 14% 846 9% 11% 29.6% 25 Small I/C 1,412 23% 1,401 14% 18% 29.6% 26 Total 6,259 100% 9,926 100% 100% 27 28 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30 MEO Gas oil Electricity charge forck Sategories		Gasiink New towns analysis gives total es	sumated load for each low		Anne it lists the hui	inder of large t	Isers it does no	uld be estagariand					
Candid small and medium). The report gave potential loads estimated for Large, Medium and Small //C for two dimerent route options. Route A included Castlebar, Route C included Ballyhaunis, Claremorris and Ballaghaderreen. An average of the two routes was taken to give an estimate of the proportion of the load which can be considered Large I/C and that which can be considered Small and Medium I/C. 20 Route A (k therms) % Average% Combining M&S 22 Route A (k therms) % Average% I/C 23 Large I/C 3,967 63% 7,679 77% 70% 70.4% 24 Medium I/C 880 14% 846 9% 11% 29.6% 25 Small I/C 1,412 23% 1,401 14% 18% 29.6% 26 Total 6,259 100% 9,926 100% 100% 29.6% 27 28 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30 30 MEO Gas oil Electricity sheek sheek		(and amplitudes. It was therefore necessary to	o use the lightes from the	d for Lorgo M	odium and Small	le proportion of	roat route opti	ione Route A inclu	as large				
Casilebral, Kotle C Included Bailynadins, Clarenton's and Bailghaderreen. An average of the two foldes was taken to give an estimate of the proportion of the load which can be considered Large I/C and that which can be considered Small and Medium I/C. 21 Route A (k therms) % Average% Combining M&S 22 Route A (k therms) % therms) % Average% I/C 23 Large I/C 3,967 63% 7,679 77% 70% 70.4% 24 Medium I/C 880 14% 846 9% 11% 29.6% 25 Small I/C 1,412 23% 1,401 14% 18% 29.6% 26 Total 6,259 100% 9,926 100% 100% 29.6% 27 28 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30 30 MEO Gas oil Electricity check 30		Castlebar, Route C included Ballybaunic		dorroon And	euluin anu Sinali		kon to give on	octimate of the pro	ueu				
20 Interiodal which can be considered Large I/C and that which can be considered Small and Medidin I/C. 21 Route A (k therms) Route C (k therms) Average% I/C 23 Large I/C 3,967 63% 7,679 77% 70% 70.4% 24 Medium I/C 880 14% 846 9% 11% 9.6% 25 Small I/C 1,412 23% 1,401 14% 18% 29.6% 26 Total 6,259 100% 9,926 100% 100% 29.6% 27 28 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30	20	the load which can be considered Large L	Calenions and ballaging	considered Sn	average of the two		ken to give an	estimate of the pro					
21 Route A (k therms) Route C (k Combining M&S 22 Route A (k therms) % Average% I/C 23 Large I/C 3,967 63% 7,679 77% 70% 70.4% 24 Medium I/C 880 14% 846 9% 11% 25 Small I/C 1,412 23% 1,401 14% 18% 29.6% 26 Total 6,259 100% 9,926 100% 100% 100% 27 28 4 Exercisity change from different fuel types. 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30 MEQ Gas oil Electricity change from different fuel types.	20	ine load which can be considered Large i				/0.							
22 Route A (k therms) % therms) % Average% I/C 23 Large I/C 3,967 63% 7,679 77% 70% 70.4% 24 Medium I/C 880 14% 846 9% 11% 25 Small I/C 1,412 23% 1,401 14% 18% 29.6% 26 Total 6,259 100% 9,926 100% 100% 29.6% 27 28 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30 MEO Gas oil Electricity check	21				Route C (k			Combining M&S	1				
23 Large I/C 3,967 63% 7,679 77% 70% 70.4% 24 Medium I/C 880 14% 846 9% 11% 25 Small I/C 1,412 23% 1,401 14% 18% 29.6% 26 Total 6,259 100% 9,926 100% 100% 27 28 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30 MEO Gas oil Electricity check	22		Route A (k therms)	%	therms)	%	Average%	I/C					
24 Medium I/C 880 14% 846 9% 11% 25 Small I/C 1,412 23% 1,401 14% 18% 29.6% 26 Total 6,259 100% 9,926 100% 100% 27 28 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30 MEO Gas oil Electricity check	23	Large I/C	3.967	63%	, 7,679	77%	70%	70.4%	1				
25 Small I/C 1,412 23% 1,401 14% 18% 29.6% 26 Total 6,259 100% 9,926 100% 100% 27 28 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30 MEO Gas oil Electricity check	24	Medium I/C	880	14%	846	9%	11%		1				
26 Total 6,259 100% 9,926 100% 100% 27 28 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30 30 MEO Gas oil Electricity check	25	Small I/C	1.412	23%	1.401	14%	18%	29.6%					
27 28 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types. 30	26	Total	6,259	100%	9,926	100%	100%		1				
28 29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types.	27		,		· · · · · ·								
29 Then combine data for all I/C users (large with medium and small) to estimate percentage rate of change from different fuel types.	28	1											
30 MEO Gas oil Flectricity check	29	Then combine data for all I/C users (large	e with medium and small)	to estimate ne	rcentage rate of c	hange from dif	ferent fuel tvne	es.					
	30		MFO	Gas oil	Electricity	check							
	<u> </u>												
All I/C (proportions of estimated load and	1	All I/C (proportions of estimated load and											
31 proportions of fuel types combined. 69.3% 24.3% 6.5% 100.0%	31	proportions of fuel types combined.	69.3%	24.3%	6.5%	100.0%							

	A	В	С	D	E	F	G	Н		
32										
33	To Calculate Fuel Cost savings total estin	nated load for 11 North W	est Towns from	n Gaslink New To	owns Analysis	Phase III is use	ed.			
34										
	Town	Estimated Industrial								
		and Commercial								
		Annual Consumption								
35		in year 7 (MWh)								
36	Ballyshannon	9,588								
37	Bundoran	10,349								
38	Donegal	43,934								
39	Lifford	4,650								
40	Letterkenny	50,969								
41	Sligo	70,379								
42	Boyle	6,310								
43	Carrick on Shannon	248,744								
44	Roscommon	32,820								
45	Strokestown	4,407								
46	Ballaghaderreen	88,451								
47	TOTAL	570,601								
48										
49		MFO	Gas Oil	Electricity*	Natural gas^					
	Price c/kWh (SEAI I/C fuel									
50	comparison July 2011)	8.09	9.16	12.75	4.25					
51										
52	To Estimate fuel cost savings if switch	n to natural gas.								
							Difference betwe	en cost of		
					Total for 3		natural gas and a	Iternative		
53	Fuel Cost Savings	MFO	Gas Oil	Electricity*	fuels	Natural gas*	fuels			
54	Proportion of load for each fuel MWh	395,199	138,419	36,983		570,601				
	Price c/kWh (SEAI I/C fuel comparison									
55	July 2011) less 20%**	6.47	7.33	12.75		4.25				
56	Price €/MWh	€64.72	€73.28	€127.50		€42.50				
57										
58	Cost of estimated load for mix of 3 fuels	€25,577,277	€10,143,344	€4,715,338	€40,435,959	€24,250,543	€16,185,4	16		
59										
60	* Band IC .=500<2000 MWh per annum									
	**20% rebate assumed, SEAI Fuel cost c	omparison Note 2:'Rebate	e may reduce th	ne fuel cost in the	e region of 20-2	25% depending	g on various market			
61	conditions.									
62	\sim ANatural gas rate Rand 12 \sim -1000 < 10.000 G L per appum									
62	The estimated applied saving for users	in the 11 towns if they	could ewitch t	o natural dae w	ould be £16 19	85 116				
03	i ne estimateu annual saving for users	in the rittowns in they (Source Switch L	o natural yas w		00,410				

	A	В	С	D	E	F	G	Н
64					_			
65	Fuel	Estimated load (MWh)	Price €/MWh*	Cost				
66	Medium Fuel Oil (MFO)	395,199	€64.72	€25,577,277				
67	Gas Oil	138,419	€73.28	€10,143,344				
68	Electricity	36,983	€127.50	€4,715,338				
69	Total	570,601		€40,435,959				
70	Natural gas	570,601	€42.50	€24,250,543				
71	Annual Saving			€16 ,185,416				

	A	В	С	D	E	F	G
1	Policy Briefing Page 10						
2	4						
3							
4	Estimate of car	bon emiss	sion savir	igs if switch t	to natural gas.		
5	Fuel Cost Savings	MFO	Gas Oil	Electricity	Total for 3 fuels	Natural gas	
6	Proportion of load for each fuel MWh	395,199	138,419	36,983	570,601	570,601	
7	Emissions Factors^ (g CO2/kWh)	273.6	263.9	533.0		205.6	
8	EF tonnes CO2/MWh	0.2736	0.2639	0.5330		0.2056	
9	Emissions for fuel (t CO2)	108,126	36,529	19,712	164,367	117,316	
10			Tonnes CC annually	02 saved	47,052		
11			Value (ann €15/t	ually) if CO2	€705,774		
12							
10		Kerosene	Coal	Electricity	Peat	Total for 4 fuels	Natural gas
15	Proportion of load for each fuel MWh	97,613	13,945	13,945	13,945	139,447	139,447
16	Emissions Factors^ (g CO2/kWh)	257.0	340.6	533.0	374.4		205.6
17	EF tonnes CO2/MWh	0.2570	0.3406	0.5330	0.3744		0.2056
18	Emissions for fuel (t CO2)	25,087	4,750	7,433	5,221	42,490	28,670
19			Tonnes CC	2 saved annually	/	13,819	
20			Value (ann	ually) if CO2 €15	/t	€207,288	
21	4						
23	1						

	A	В	С	D	E	F	G					
1	Fuel cost savings for I/C users in '	11 towns, *Large a	and Small and m	edium users								
2	(Policy Briefing page 10)											
3	1											
4	To estimate fuel to be switched from	۱ (from Gas to the N	W study). Percer	ntage estimates giver	n in report Append	dix G						
	Assumptions that 'fuel oil' is Medium	n Fuel Oil (MFO), tha	t Distillates are C	Sas oil: that the electr	icitv rate payable	is SEAI medium I	pand (for 500-2000					
5	MWh per annum). Natural gas rate F	Band I2 >=1000<10.	000 GJ per annu	m								
	Prices for MFO and Gas oil and Elec	ctricity from SEAI Fu	el cost comparis	on Commercial/ Indu	strial Fuels Comp	parison of Energy	Costs 01 April 2011					
6			•		•	0.						
7	1											
8	To estimate fuel to be switched from (from Gas to the NW study). Percentage estimates given in report Appendix G											
9	1											
10	Users expected to switch to natural of	gas from fuels in per	centages below									
11	·	MFO	Gas oil	Electricity								
12	Large I/C users	90%	5%	5%								
13	Medium & Small users	20%	70%	10%								
14												
15	Then to Estimate proportion of Large	e and Small and Med	dium users									
16												
	Gaslink New towns analysis gives to	ital estimated load to	or each town. Ho	wever while it lists th	e number of large	e users it does not	give information of					
	size of large loads. It was therefore	necessary to use the	e figures from the	e Gas to the NVV stud	y to estiamte pro	portion of load wh	ich could be					
	categorised as large (and small and	medium). The report	It gave potential		arge, iviedium and	d Small I/C for two) different route					
17	options. Route A included Castlebal	the load which can	ballynaunis, Ciai	emoria and ballagia	b con bo conside	rage of the two to	ules was taken to					
18	give an estimate of the proportion of	the load which can		arge i/C and that which	n can be conside	ered Small and we	alum //C.					
10	 	· · · · · · · · · · · · · · · · · · ·		1			Combining M&S					
19	1	Route A	%	Route C	%	Average%	I/C					
20	Large I/C	3,967	63%	7,679	77%	70%	70.4%					
21	Medium I/C	880	14%	846	9%	11%	29.6%					
22	Small I/C	1,412	23%	1,401	14%	18%						
23	Total	6,259	100%	9,926	100%	100%						
24												
25	Then combine data for all I/C users ((large with medium a	and small) to esti	mate percentage rate	of change from o	different fuel types	S.					
26		MFO	Gas oil	Electricity	check							
	All I/C (proportions of estimated											
	load and proportions of fuel types	22.22/	0 4 00 4	0 =0/	100.00/							
27	combined.	69.3%	24.3%	6.5%	100.0%							
28	1											

	A	В	С	D	E	F	G
29	To Calculate Fuel Cost savings to	tal estimated load f	for 11 North We	st Towns from Gas	link New Towns A	Analysis Phase I	ll is used.
30							
		Estimated					
		Industrial and					
		Commercial					
		Annual					
		Consumption in					
31	Town	year 7 (MWh)					
32	Ballyshannon	9,588					
33	Bundoran	10,349					
34	Donegal	43,934					
35	Lifford	4,650					
36	Letterkenny	50,969					
37	Sligo	70,379					
38	Boyle	6,310					
39	Carrick on Shannon	248,744					
40	Roscommon	32,820					
41	Strokestown	4,407					
42	Ballaghaderreen	88,451					
43	TOTAL	570,601					
44							
45	Estimate of carbon emission savi	ngs if switch to nat	ural gas		1 1		1
46	Fuel Cost Savings	MFO*	Gas Oil**	Electricity***	Total for 3 fuels	Natural gas*	
	Proportion of load for each fuel						
47	MWh	395,199	138,419	36,983	570,601	570,601	
48	Emissions Factors^ (g CO ₂ /kWh)	273.6	263.9	533.0		205.6	
49	EF tonnes CO ₂ /MWh	0.2736	0.2639	0.5330		0.2056	
50	Emissions for fuel (t CO2)	108,126	36,529	19,712	164,367	117,316	
51			Tonnes CO2	2 saved annually	47,052		J
52			Value (annu	ally) if CO2 €15/t	€705,774		
53		I	,		, , ,		1
54	^ Source: SEAI http://www.seai.ie/F	Publications/Statistics	s_Publications/Er	mission_Factors/			
55	* Residual oil EF						
56	**Gas/Diesel oil EF						
57	*** 2009 factor						

	A	В	С	D	E	F	G	Н				
1	Fuel cost savings for Domestic users i	n 11 towns	•									
2	(Policy Briefing page 9)											
3		_				_						
4	To estimate fuel to be switched from (from	n Gas to the NW study)	. Percentage est	timates given in re	port Appendix	G						
5	Prices for fuels from SEAL Fuel cost comparison. Comparison of Energy Costs 01, July 2011											
6	Frices for fuels from SEAFFuel cost comparison. Comparison of Energy Costs of July 2011											
7	To estimate fuel to be switched from (from	n Gas to the NW study)	. Percentage est	imates given in re	port Appendix	G						
8		• • •	0	0								
9	Residental users expected to switch to	o natural gas from fuel	s in percentage	s below								
10		Distillates	Coal	Electricity	Peat							
11	Residential	70%	10%	10%	10%							
12												
13	Distillates are assumed to be kerosene											
14	Rates used (SEAL.July 2011):		1									
16	Distillates (Kerosene)	7.93c/kWh										
17	Coal (Standard coal)	4.43c/kWh										
	Electricity (Band DC>=2500<5000kWh											
18	per annum	18.75c/kWh										
19	Peat (Briquettes, Baled)	5.82c/kWh										
	Natural Gas (Band D>=20<200GJ per											
20	annum)	5.27c/kWh										
21		-										
22	Town	New Housing Load	(Forecast Sum	mary, year 10)	(MWh)							
23	Ballyshannon	4,420	29 new connect	ons each year	29							
24	Bundoran	3,048	20 new connect	ons each year	20							
25	Donegal	3,658	24 new connect	ons each year	24							
26	Lifford	2,134	14 new connect	ons each year	14							
27	Letterkenny	39,929	262 new connec	tions each year	262							
28	Sligo	64,008	420 new connec	tions each year	420							
29	Boyle	4,572	30 new connect	ons each year	30							
30	Carrick on Shannon	5,486	36 new connect	ons each year	36							
31	Roscommon	7,925	52 new connect	ons each year	52							
32	Strokestown*	1,219	8 new connectio	ns each year	8							
33	Ballaghaderreen	3,048	20 new connect	ons each year	20							
34	TOTAL	139,447			915							

	A	В	С	D	Е	F	G	Н	I
35	* estimated as original as Figure in Report inc	orrect (estimate based on	forecast of 8 new h	ouses per year and d	lemand per hou	se as in New To	wns Analysis)		
36					-				
	To Estimate fuel cost servines if switch	to natural aga							
37	To Estimate just cost savings if switch	to natural gas.							
								Difference	between
						Total for 4		cost of nat	ural gas
38	Fuel Cost Savings	Kerosene	Coal	Electricity	Peat	fuels	Natural gas*	and alterna	tive fuels
39	Proportion of load for each fuel MWh	97,613	13,945	13,945	13,945	139,447	139,447		
	Price c/kWh (SEAI Domestic fuel								
40	comparison July 2011)	7.93	4.43	18.75	5.82		5.27		
41	Price €/MWh	€79.30	€44.30	€187.50	€58.20		€52.70		
42									
43	Cost of estimated load for mix of 3 fuels	€7,740,703	€617,750	€2,614,631	€811,582	€11,784,666	€7,348,857	€4,435	,809
44									
45	* see above for rate used.								
46									
47	The estimated annual saving for new d	omestic users in the 1	1 towns if they w	vere connected t	to natural gas	s would be €4	435,809		
48									
49	Fuel	Estimated load (MWh)	Price €/MWh*	Cost					
50	Kerosene	97,613	€79.30	€7,740,703					
51	Coal	13,945	€44.30	€617,750					
52	Electricity	13,945	€187.50	€2,614,631					
53	Peat	13,945	€58.20	€811,582					
54	Total	139,447		€11,784,666					
55	Natural gas	139,447	€52.70	€7,348,857					
56	Annual Saving			€4,435,809					
57									
	New housing connections each year (as estimated								
58	for year 10)	915							
59	Total after 10 years	9150							
60									
61	Saving per house per vear	€484.79							

	A	В	С	D	E	F	G	Н	
1	(Policy Briefing page 5)								
2								-	
		I&C load forecast	New Hou	sing Load	(Forecast S	Summary,			
3	Town	year 7 (MWh)		year 10) (MWh)		Total		
4	Ballyshannon	9,588	4,420	29 new coi	nnections ea	ach year	14,008		
5	Bundoran	10,349	3,048	20 new coi	nnections ea	ach year	13,397		
6	Donegal	43,934	3,658	24 new coi	nnections ea	ach year	47,592		
7	Lifford	4,650	2,134	14 new coi	nnections ea	ach year	6,784		
8	Letterkenny	50,969	39,929	262 new co	onnections	each year	90,898		
9	Sligo	70,379	64,008	420 new co	onnections (each year	134,387		
10	Boyle	6,310	4,572	30 new coi	nnections ea	ach year	10,882		
11	Carrick on Shannon	248,744	5,486	36 new coi	nnections ea	ach year	254,230		
12	Roscommon	32,820	7,925	52 new coi	nnections ea	ach year	40,745		
13	Strokestown*	4,407	1,219	8 new coni	nections ead	ch year	5,626		
14	Ballaghaderreen	88,451	3,048	20 new coi	nnections ea	ach year	91,499		
15	TOTAL	570,601	139,447				710,048		
16									
17	* estimated as original as Figure in Report in	correct (estimate based on foreca	st of 8 new hou	ses per year and	demand per ho	use as in New To	owns Analysis)		
18									
19									

	А	В	С	D	E	F	G						
1	Carbon emissions savings	for Domestic u	sers in 11 tov	vns	•								
2	(Policy Briefing page 10)												
3													
4	To estimate fuel to be switch	ned from (from G	as to the NW s	study*). Perce	ntage estimates given	in report Appe	ndix G						
5	*Fingleton white et al., 2007, 0	Gas to the Northwe	est Feasibility S	tuay commissio	ned by DCMINK.								
- 0													
/ 8	Prices for fuels from SEALF	uel cost company	son Company	son of Energy	Costs 01 April 2011								
9													
10													
11	Residental users expected to switch to natural gas from fuels in percentages below												
12		Distillates	Coal	Electricity	Peat								
13	Residential	70%	10%	10%	10%								
14													
15	Distillates are assumed to be kerosene												
10													
	Town New Housing Load (Forecast Summary, year 10) (MWh)												
18		i tetti i i tutusing			y, year 10 (101 (101))								
19	Ballyshannon	4,420	29 new conne	ections each ye	ear								
20	Bundoran	3,048	20 new conne	ections each ye	ear								
21	Donegal	3,658	24 new conne	ections each ye	ear								
22	Lifford	2,134	14 new conne	ections each ye	ear								
23	Letterkenny	39,929	262 new conr	nections each	year								
24	Sligo	64,008	420 new conr	nections each	year								
25	Boyle	4,572	30 new conne	ections each ye	ear								
26	Carrick on Shannon	5,486	36 new conne	ections each ye	ear								
27	Roscommon	7,925	52 new conne	ections each ye	ear								
28	Strokestown*	1,219	8 new conned	ctions each yea	ar								
29	Ballaghaderreen	3,048	20 new conne	ections each ye	ear								
30	TOTAL	139,447											
31													
	* estimated as original as Figure in Rep	port incorrect (estimate	based on forecast o	f 8 new houses per y	year and demand per house as	in New Towns Analy	sis)						
32													

	A	В	С	D	E	F	G
33	Estimate of carbon emis	sions savings if	switch to na	itural gas			
						Total for 4	
34	Fuel Cost Savings	Kerosene	Coal	Electricity	Peat*	fuels	Natural gas*
	Proportion of load for each		10.015	10.045	10.045	400.447	
35		97,613	13,945	13,945	13,945	139,447	139,447
	Emissions Factors^ (g		1	i			1
36	CO ₂ /kWh)	257.0	340.6	533.0	374.4		205.6
37	EF tonnes CO ₂ /MWh	0.2570	0.3406	0.5330	0.3744		0.2056
38	Emissions for fuel (t CO ₂)	25,087	4,750	7,433	5,221	42,490	28,670
39				Tonnes CO ₂ s	aved annually	13,819	
40				Value (annuall	y) if CO ₂ €15/t	€207,288	
41							
42	*sod peat						
43	* see above for rate used.						
44	The estimated annual savi gas would be €207.288	ng of emissions	for new dom	estic users in	the 11 towns if they	were connect	ted to natural

45