Jinmahn Jo (ID#: 915528897)

1 Breakdown of ATEs by Tariff Group, Using Rate Changes in Peak Hours

1.1 Interval of Hours: 15 to 16, Knot = 10

	Dependent Variable				
	Hourly Electricity Consumption (kWh/Hour)				
	(1)	(2)	(3)	(4)	
HDDs	0.016***	0.016***	0.016***	0.015***	
	(0.004)	(0.004)	(0.004)	(0.004)	
HDDs^*	0.010	0.009	0.009	0.010	
	(0.007)	(0.007)	(0.007)	(0.007)	
1[Treatment]	0.009	0.106	-0.014	0.174**	
	(0.050)	(0.071)	(0.049)	(0.072)	
$\mathbb{1}[\text{Treatment}] \times \text{HDDs}$	0.001	0.004	0.001	0.0003	
	(0.003)	(0.005)	(0.003)	(0.004)	
$1[Treatment] \times HDDs^*$	-0.0001	-0.012^{*}	0.0004	0.002	
	(0.004)	(0.006)	(0.003)	(0.005)	
1[Post]	0.014	0.015	0.014	0.011	
	(0.022)	(0.022)	(0.022)	(0.023)	
$\mathbb{1}[\text{Post}] \times \text{HDDs}$	-0.007	-0.007	-0.007	-0.006	
	(0.005)	(0.005)	(0.005)	(0.005)	
$\mathbb{1}[\mathrm{Post}] \times \mathrm{HDDs}^*$	0.002	0.002	0.002	0.001	
	(0.008)	(0.008)	(0.008)	(0.008)	
1[Treatment & Post]	-0.038	-0.039	0.020	-0.039	
	(0.023)	(0.030)	(0.026)	(0.038)	
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs}$	0.001	-0.003	-0.0002	0.001	
	(0.003)	(0.004)	(0.003)	(0.004)	
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs}^*$	-0.002	0.008	-0.004	-0.005	
	(0.004)	(0.006)	(0.004)	(0.006)	
Tariff Group	A	В	C	D	
Interval of Hours	15 to 16	15 to 16	15 to 16	15 to 16	
Knot	10	10	10	10	
FEs: Household by Half-Hourly Time Window	No	No	No	No	
FEs: Day of Week by Half-Hourly Time Window	Yes	Yes	Yes	Yes	
Observations	506,540	326,800	511,700	331,960	
Adjusted \mathbb{R}^2	0.024	0.024	0.023	0.025	

1.2 Interval of Hours: 17 to 18, Knot = 10

		Dependen	t Variable			
	1	Hourly Electricity Consumption (kWh/Hour)				
	(1)	(2)	(3)	(4)		
HDDs	0.042*** (0.006)	0.042*** (0.006)	0.042*** (0.006)	0.042*** (0.006)		
HDDs^*	0.001 (0.010)	0.0004 (0.010)	0.0003 (0.010)	0.001 (0.010)		
1[Treatment]	0.017 (0.063)	0.171* (0.093)	-0.022 (0.063)	0.249*** (0.083)		
$\mathbb{1}[\text{Treatment}] \times \text{HDDs}$	0.011** (0.004)	0.009 (0.006)	0.005 (0.004)	0.004 (0.006)		
$\mathbb{1}[\mathrm{Treatment}] \times \mathrm{HDDs}^*$	-0.010^* (0.005)	-0.006 (0.007)	-0.007^* (0.004)	-0.003 (0.005)		
$\mathbb{1}[\mathrm{Post}]$	0.044 (0.035)	0.045 (0.036)	0.046 (0.036)	0.043 (0.035)		
$\mathbb{1}[\mathrm{Post}] \times \mathrm{HDDs}$	-0.015^* (0.008)	-0.015^* (0.008)	-0.015^* (0.008)	-0.015^* (0.008)		
$\mathbb{1}[\mathrm{Post}] \times \mathrm{HDDs}^*$	0.007 (0.013)	0.008 (0.013)	0.008 (0.013)	0.007 (0.013)		
1[Treatment & Post]	-0.057^* (0.030)	-0.127^{***} (0.039)	-0.078^{**} (0.031)	-0.189^{***} (0.041)		
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs}$	-0.010^{***} (0.004)	-0.002 (0.005)	-0.004 (0.003)	-0.009 (0.006)		
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs*}$	0.013*** (0.005)	0.003 (0.006)	0.005 (0.003)	0.011* (0.006)		
Tariff Group Interval of Hours	A 17 to 18	B 17 to 18	C 17 to 18	D 17 to 18		
Knot FEs: Household by Half-Hourly Time Window FEs: Day of Week by Half-Hourly Time Window	10 No Yes	10 No Yes	10 No Yes	10 No Yes		
Observations Adjusted R^2	506,540 0.046	326,800 0.044	511,700 0.044	331,960 0.045		

1.3 Interval of Hours: 19 to 20, Knot = 10

		Depender	nt Variable			
		Hourly Electricity Consumption (kWh/Hour)				
	(1)	(2)	(3)	(4)		
HDDs	0.047*** (0.004)	0.047*** (0.004)	0.047*** (0.004)	0.047*** (0.004)		
HDDs^*	-0.018*** (0.007)	-0.018*** (0.007)	-0.018*** (0.007)	-0.018^{***} (0.007)		
1[Treatment]	0.057 (0.055)	0.189** (0.083)	-0.017 (0.052)	0.150** (0.072)		
$\mathbb{1}[\text{Treatment}] \times \text{HDDs}$	0.009** (0.004)	0.008 (0.007)	0.008** (0.004)	0.011 (0.007)		
$1 [Treatment] \times HDDs^*$	-0.012^{***} (0.004)	-0.016** (0.008)	-0.013^{***} (0.004)	-0.008 (0.007)		
1[Post]	0.048 (0.040)	0.049 (0.040)	0.047 (0.040)	0.047 (0.040)		
$\mathbb{1}[\mathrm{Post}] \times \mathrm{HDDs}$	-0.015** (0.006)	-0.015** (0.006)	-0.015** (0.006)	-0.015^{**} (0.006)		
$1[Post] \times HDDs^*$	0.006 (0.009)	0.007 (0.009)	0.006 (0.009)	0.006 (0.009)		
1[Treatment & Post]	-0.040 (0.029)	-0.050 (0.037)	0.006 (0.027)	-0.025 (0.040)		
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs}$	-0.003 (0.003)	0.0005 (0.005)	0.0003 (0.003)	-0.009 (0.006)		
$1 [\text{Treatment \& Post}] \times \text{HDDs*}$	0.005 (0.004)	0.010 (0.007)	0.004 (0.003)	0.008 (0.006)		
Tariff Group Interval of Hours	A 19 to 20	B 19 to 20	C 19 to 20	D 19 to 20		
Knot FEs: Household by Half-Hourly Time Window FEs: Day of Week by Half-Hourly Time Window	10 No Yes	10 No Yes	10 No Yes	10 No Yes		
Observations Adjusted R^2	506,540 0.041	326,800 0.040	511,700 0.039	331,960 0.043		

1.4 Interval of Hours: 15 to 18, Knot = 10

		Dependent Variable Hourly Electricity Consumption (kWh/Hour)				
	(1)	(2)	(3)	(4)		
HDDs	0.029*** (0.005)	0.029*** (0.005)	0.029*** (0.005)	0.029*** (0.005)		
HDDs^*	0.005 (0.008)	0.005 (0.008)	0.005 (0.008)	0.006 (0.008)		
1[Treatment]	0.013 (0.053)	0.138* (0.077)	-0.018 (0.053)	0.211*** (0.070)		
$\mathbb{1}[\text{Treatment}] \times \text{HDDs}$	0.006* (0.003)	0.007 (0.004)	0.003 (0.003)	0.002 (0.004)		
$\mathbb{1}[\text{Treatment}] \times \text{HDDs}^*$	-0.005 (0.004)	-0.009^{**} (0.004)	-0.003 (0.003)	-0.001 (0.003)		
$\mathbb{1}[\operatorname{Post}]$	0.029 (0.026)	0.030 (0.026)	0.030 (0.026)	0.027 (0.026)		
$\mathbb{1}[\mathrm{Post}] \times \mathrm{HDDs}$	-0.011^* (0.006)	-0.011^* (0.006)	-0.011^* (0.006)	-0.011^* (0.006)		
$\mathbb{1}[\mathrm{Post}] \times \mathrm{HDDs}^*$	0.004 (0.010)	0.005 (0.010)	0.005 (0.010)	0.004 (0.010)		
1[Treatment & Post]	-0.047^{**} (0.022)	-0.083^{***} (0.028)	-0.029 (0.022)	-0.114^{***} (0.033)		
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs}$	-0.005^* (0.002)	-0.002 (0.003)	-0.002 (0.002)	-0.004 (0.004)		
$1[\text{Treatment \& Post}] \times \text{HDDs}^*$	0.005** (0.003)	0.005 (0.004)	0.001 (0.002)	0.003 (0.003)		
Tariff Group Interval of Hours	A 15 to 18	B 15 to 18	C 15 to 18	D 15 to 18		
Knot FEs: Household by Half-Hourly Time Window FEs: Day of Week by Half-Hourly Time Window	10 No Yes	10 No Yes	10 No Yes	10 No Yes		
Observations Adjusted \mathbb{R}^2	1,013,080 0.061	653,600 0.059	$1,023,400 \\ 0.055$	$663,920 \\ 0.057$		

1.5 Interval of Hours: 17 to 20, Knot = 10

		Dependent Variable				
	Hourly Electricity Consumption (kWh/Hour)					
	(1)	(2)	(3)	(4)		
HDDs	0.045***	0.045***	0.045***	0.044***		
	(0.005)	(0.005)	(0.005)	(0.005)		
HDDs*	-0.008	-0.009	-0.009	-0.008		
	(0.007)	(0.008)	(0.007)	(0.008)		
1[Treatment]	0.037	0.180**	-0.019	0.199***		
	(0.055)	(0.082)	(0.054)	(0.072)		
$1[Treatment] \times HDDs$	0.010***	0.009	0.007*	0.008		
	(0.004)	(0.006)	(0.004)	(0.006)		
$1[Treatment] \times HDDs^*$	-0.011***	-0.011*	-0.010***	-0.005		
	(0.004)	(0.006)	(0.003)	(0.004)		
1[Post]	0.046	0.047	0.047	0.045		
	(0.035)	(0.035)	(0.035)	(0.035)		
$\mathbb{1}[\text{Post}] \times \text{HDDs}$	-0.015**	-0.015**	-0.015**	-0.015**		
	(0.006)	(0.006)	(0.006)	(0.006)		
$\mathbb{1}[Post] \times HDDs^*$	0.007	0.007	0.007	0.006		
	(0.010)	(0.010)	(0.010)	(0.010)		
1[Treatment & Post]	-0.049^{*}	-0.089***	-0.036	-0.107***		
	(0.026)	(0.032)	(0.025)	(0.030)		
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs}$	-0.006**	-0.001	-0.002	-0.009*		
	(0.003)	(0.004)	(0.002)	(0.005)		
$1 [Treatment \& Post] \times HDDs^*$	0.009***	0.006	0.005**	0.009**		
	(0.003)	(0.004)	(0.002)	(0.004)		
Tariff Group	A	В	C	D		
Interval of Hours	17 to 20	17 to 20	17 to 20	17 to 20		
Knot	10	10	10	10		
FEs: Household by Half-Hourly Time Window	No	No	No	No		
FEs: Day of Week by Half-Hourly Time Window	Yes	Yes	Yes	Yes		
Observations	1,013,080	653,600	1,023,400	663,920		
Adjusted R ²	0.043	0.042	0.041	0.044		

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2 Breakdown of ATEs by Tariff Group, Using Different Rate Changes

2.1 Interval of Hours: 15 to 16, Knot = 10

	Dependent Variable				
	Hourly Electricity Consumption (kWh/Hour)				
	(1)	(2)	(3)	(4)	
HDDs	0.016***	0.016***	0.016***	0.015***	
	(0.004)	(0.004)	(0.004)	(0.004)	
HDDs^*	0.010	0.009	0.009	0.010	
	(0.007)	(0.007)	(0.007)	(0.007)	
1[Treatment]	0.009	0.106	-0.014	0.174**	
	(0.050)	(0.071)	(0.049)	(0.072)	
$\mathbb{1}[\text{Treatment}] \times \text{HDDs}$	0.001	0.004	0.001	0.0003	
	(0.003)	(0.005)	(0.003)	(0.004)	
$1[Treatment] \times HDDs^*$	-0.0001	-0.012^{*}	0.0004	0.002	
	(0.004)	(0.006)	(0.003)	(0.005)	
1[Post]	0.014	0.015	0.014	0.011	
	(0.022)	(0.022)	(0.022)	(0.023)	
$\mathbb{1}[\text{Post}] \times \text{HDDs}$	-0.007	-0.007	-0.007	-0.006	
	(0.005)	(0.005)	(0.005)	(0.005)	
$\mathbb{1}[\mathrm{Post}] \times \mathrm{HDDs}^*$	0.002	0.002	0.002	0.001	
	(0.008)	(0.008)	(0.008)	(0.008)	
1[Treatment & Post]	-0.038	-0.039	0.020	-0.039	
	(0.023)	(0.030)	(0.026)	(0.038)	
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs}$	0.001	-0.003	-0.0002	0.001	
	(0.003)	(0.004)	(0.003)	(0.004)	
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs}^*$	-0.002	0.008	-0.004	-0.005	
	(0.004)	(0.006)	(0.004)	(0.006)	
Tariff Group	A	В	C	D	
Interval of Hours	15 to 16	15 to 16	15 to 16	15 to 16	
Knot	10	10	10	10	
FEs: Household by Half-Hourly Time Window	No	No	No	No	
FEs: Day of Week by Half-Hourly Time Window	Yes	Yes	Yes	Yes	
Observations	506,540	326,800	511,700	331,960	
Adjusted \mathbb{R}^2	0.024	0.024	0.023	0.025	

2.2 Interval of Hours: 17 to 18, Knot = 10

		Dependen	t Variable			
	1	Hourly Electricity Consumption (kWh/Hour)				
	(1)	(2)	(3)	(4)		
HDDs	0.042*** (0.006)	0.042*** (0.006)	0.042*** (0.006)	0.042*** (0.006)		
HDDs^*	0.001 (0.010)	0.0004 (0.010)	0.0003 (0.010)	0.001 (0.010)		
1[Treatment]	0.017 (0.063)	0.171* (0.093)	-0.022 (0.063)	0.249*** (0.083)		
$\mathbb{1}[\text{Treatment}] \times \text{HDDs}$	0.011** (0.004)	0.009 (0.006)	0.005 (0.004)	0.004 (0.006)		
$\mathbb{1}[\mathrm{Treatment}] \times \mathrm{HDDs}^*$	-0.010^* (0.005)	-0.006 (0.007)	-0.007^* (0.004)	-0.003 (0.005)		
$\mathbb{1}[\mathrm{Post}]$	0.044 (0.035)	0.045 (0.036)	0.046 (0.036)	0.043 (0.035)		
$\mathbb{1}[\mathrm{Post}] \times \mathrm{HDDs}$	-0.015^* (0.008)	-0.015^* (0.008)	-0.015^* (0.008)	-0.015^* (0.008)		
$\mathbb{1}[\mathrm{Post}] \times \mathrm{HDDs}^*$	0.007 (0.013)	0.008 (0.013)	0.008 (0.013)	0.007 (0.013)		
1[Treatment & Post]	-0.057^* (0.030)	-0.127^{***} (0.039)	-0.078^{**} (0.031)	-0.189^{***} (0.041)		
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs}$	-0.010^{***} (0.004)	-0.002 (0.005)	-0.004 (0.003)	-0.009 (0.006)		
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs*}$	0.013*** (0.005)	0.003 (0.006)	0.005 (0.003)	0.011* (0.006)		
Tariff Group Interval of Hours	A 17 to 18	B 17 to 18	C 17 to 18	D 17 to 18		
Knot FEs: Household by Half-Hourly Time Window FEs: Day of Week by Half-Hourly Time Window	10 No Yes	10 No Yes	10 No Yes	10 No Yes		
Observations Adjusted R^2	506,540 0.046	326,800 0.044	511,700 0.044	331,960 0.045		

2.3 Interval of Hours: 19 to 20, Knot = 10

		Dependen	t Variable	
	Hourly Electricity Consumption (kWh/Hour)			
	(1)	(2)	(3)	(4)
HDDs	0.047***	0.047***	0.047***	0.047***
	(0.004)	(0.004)	(0.004)	(0.004)
HDDs^*	-0.018***	-0.018***	-0.018***	-0.018***
	(0.007)	(0.007)	(0.007)	(0.007)
1[Treatment]	0.057	0.189**	-0.017	0.150**
	(0.055)	(0.083)	(0.052)	(0.072)
1[Treatment] × HDDs	0.009**	0.008	0.008**	0.011
	(0.004)	(0.007)	(0.004)	(0.007)
$1[Treatment] \times HDDs^*$	-0.012***	-0.016**	-0.013***	-0.008
	(0.004)	(0.008)	(0.004)	(0.007)
1[Post]	0.048	0.049	0.047	0.047
	(0.040)	(0.040)	(0.040)	(0.040)
$\mathbb{1}[\text{Post}] \times \text{HDDs}$	-0.015**	-0.015**	-0.015**	-0.015**
	(0.006)	(0.006)	(0.006)	(0.006)
$\mathbb{1}[\text{Post}] \times \text{HDDs}^*$	0.006	0.007	0.006	0.006
	(0.009)	(0.009)	(0.009)	(0.009)
1[Treatment & Post]	-0.040	-0.050	0.006	-0.025
	(0.029)	(0.037)	(0.027)	(0.040)
1[Treatment & Post] × HDDs	-0.003	0.0005	0.0003	-0.009
	(0.003)	(0.005)	(0.003)	(0.006)
1[Treatment & Post] × HDDs*	0.005	0.010	0.004	0.008
	(0.004)	(0.007)	(0.003)	(0.006)
Tariff Group	A	В	C	D
Interval of Hours	19 to 20	19 to 20	19 to 20	19 to 20
Knot	10	10	10	10
FEs: Household by Half-Hourly Time Window	No	No	No	No
FEs: Day of Week by Half-Hourly Time Window	Yes	Yes	Yes	Yes
Observations	506,540	326,800	511,700	331,960
Adjusted R ²	0.041	0.040	0.039	0.043

2.4 Interval of Hours: 15 to 18, Knot = 10

		Depender	nt Variable			
		Hourly Electricity Consumption (kWh/Hour)				
	(1)	(2)	(3)	(4)		
HDDs	0.029*** (0.005)	0.029*** (0.005)	0.029*** (0.005)	0.029*** (0.005)		
HDDs^*	0.005 (0.008)	0.005 (0.008)	0.005 (0.008)	0.006 (0.008)		
1[Treatment]	0.013 (0.053)	0.138* (0.077)	-0.018 (0.053)	0.211*** (0.070)		
$\mathbb{1}[\text{Treatment}] \times \text{HDDs}$	0.006* (0.003)	0.007 (0.004)	0.003 (0.003)	0.002 (0.004)		
$1[Treatment] \times HDDs^*$	-0.005 (0.004)	-0.009^{**} (0.004)	-0.003 (0.003)	-0.001 (0.003)		
1[Post]	0.029 (0.026)	0.030 (0.026)	0.030 (0.026)	0.027 (0.026)		
$\mathbb{1}[\mathrm{Post}] \times \mathrm{HDDs}$	-0.011^* (0.006)	-0.011^* (0.006)	-0.011^* (0.006)	-0.011^* (0.006)		
$\mathbb{1}[\mathrm{Post}] \times \mathrm{HDDs}^*$	0.004 (0.010)	0.005 (0.010)	0.005 (0.010)	0.004 (0.010)		
1[Treatment & Post]	-0.047^{**} (0.022)	-0.083^{***} (0.028)	-0.029 (0.022)	-0.114^{***} (0.033)		
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs}$	-0.005^* (0.002)	-0.002 (0.003)	-0.002 (0.002)	-0.004 (0.004)		
$1[Treatment \& Post] \times HDDs^*$	0.005** (0.003)	0.005 (0.004)	0.001 (0.002)	0.003 (0.003)		
Tariff Group Interval of Hours	A 15 to 18	B 15 to 18	C 15 to 18	D 15 to 18		
Knot FEs: Household by Half-Hourly Time Window	10 No	10 No	10 No	10 No		
FEs: Day of Week by Half-Hourly Time Window Observations $ \label{eq:constraints} \mbox{Adjusted } \mbox{R}^2 $	Yes 1,013,080 0.061	Yes 653,600 0.059	Yes 1,023,400 0.055	Yes 663,920 0.057		

2.5 Interval of Hours: 17 to 20, Knot = 10

	Dependent Variable Hourly Electricity Consumption (kWh/Hour)				
	(1)	(2)	(3)	(4)	
HDDs	0.045*** (0.005)	0.045*** (0.005)	0.045*** (0.005)	0.044*** (0.005)	
HDDs^*	-0.008 (0.007)	-0.009 (0.008)	-0.009 (0.007)	-0.008 (0.008)	
$\mathbb{1}[\text{Treatment}]$	0.037 (0.055)	0.180** (0.082)	-0.019 (0.054)	0.199*** (0.072)	
$\mathbb{1}[\text{Treatment}] \times \text{HDDs}$	0.010*** (0.004)	0.009 (0.006)	0.007* (0.004)	0.008 (0.006)	
$1 [{\rm Treatment}] \times {\rm HDDs}^*$	-0.011^{***} (0.004)	-0.011^* (0.006)	-0.010^{***} (0.003)	-0.005 (0.004)	
1[Post]	0.046 (0.035)	0.047 (0.035)	0.047 (0.035)	0.045 (0.035)	
$\mathbb{1}[\mathrm{Post}] \times \mathrm{HDDs}$	-0.015** (0.006)	-0.015^{**} (0.006)	-0.015** (0.006)	-0.015^{**} (0.006)	
$1[Post] \times HDDs^*$	0.007 (0.010)	0.007 (0.010)	0.007 (0.010)	0.006 (0.010)	
1[Treatment & Post]	-0.049^* (0.026)	-0.089^{***} (0.032)	-0.036 (0.025)	-0.107*** (0.030)	
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs}$	-0.006** (0.003)	-0.001 (0.004)	-0.002 (0.002)	-0.009^* (0.005)	
$\mathbb{1}[\text{Treatment \& Post}] \times \text{HDDs*}$	0.009*** (0.003)	0.006 (0.004)	0.005** (0.002)	0.009** (0.004)	
Tariff Group Interval of Hours	A 17 to 20	B 17 to 20	C 17 to 20	D 17 to 20	
Knot FEs: Household by Half-Hourly Time Window FEs: Day of Week by Half-Hourly Time Window	10 No Yes	10 No Yes	10 No Yes	10 No Yes	
Observations Adjusted \mathbb{R}^2	1,013,080 0.043	$653,\!600 \\ 0.042$	1,023,400 0.041	663,920 0.044	