



NHH

Scrapping a wind turbine:

Nedleggelse av vindturbiner og rollen av alternativkostnad og teknologisk utvikling

Johannes Mauritzen
NHH
Bergen , Norge

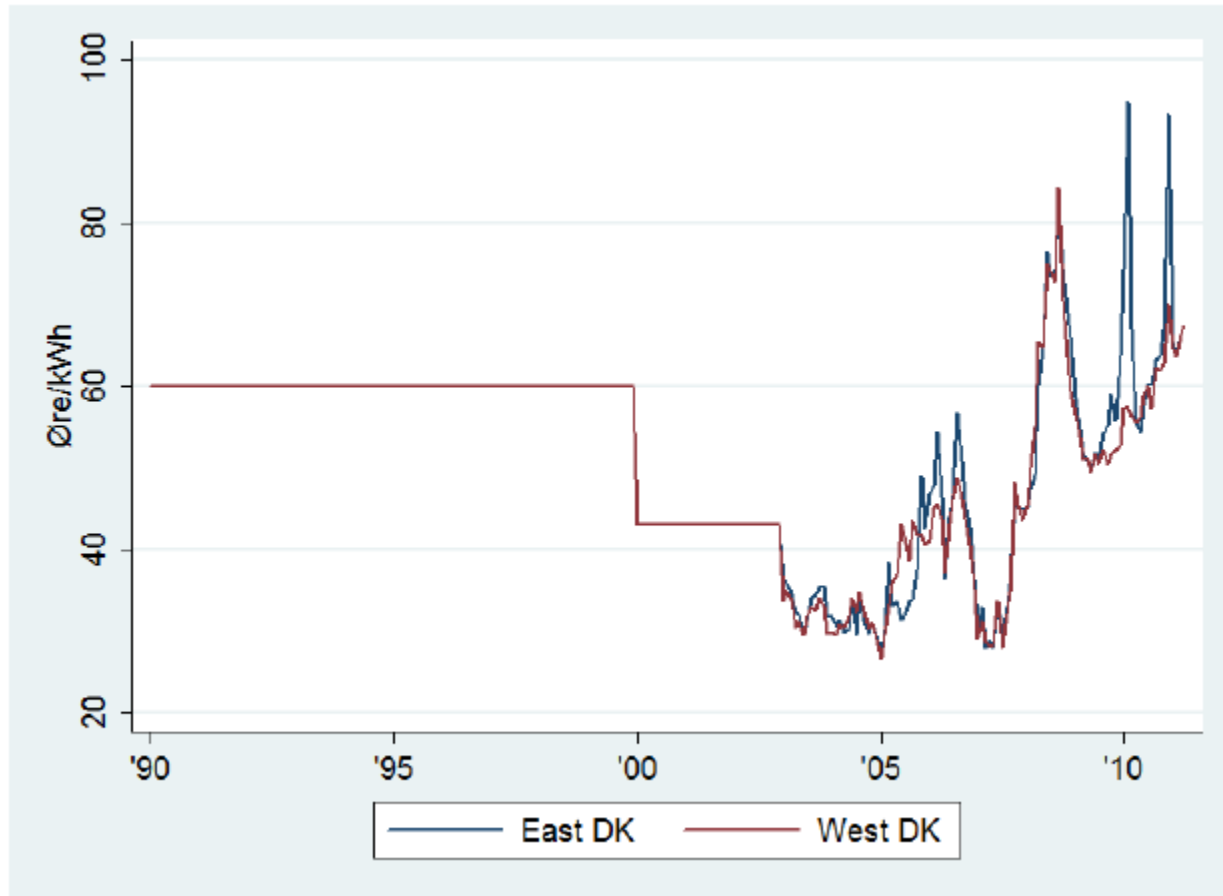
og

Institutet för Näringslivsforskning
Stockholm, Sverige
johannes.mauritzen@nhh.no

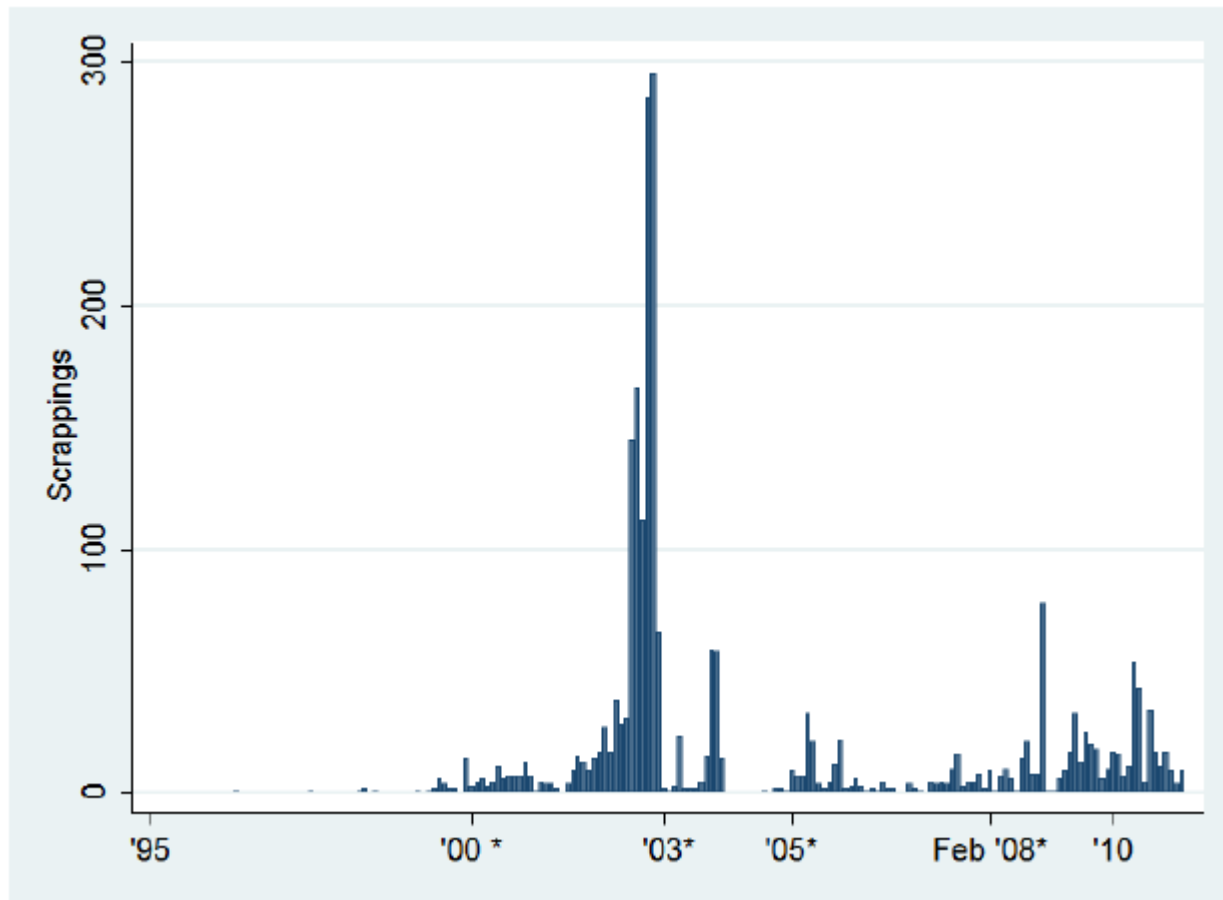
Working paper available at:

<http://www.nhh.no/en/research---faculty/departments-of-finance-and-management-science/>

Pris for Vindkraft i Danmark



Nedleggelser per måned



Indeks av Kapasitetsutnyttelse

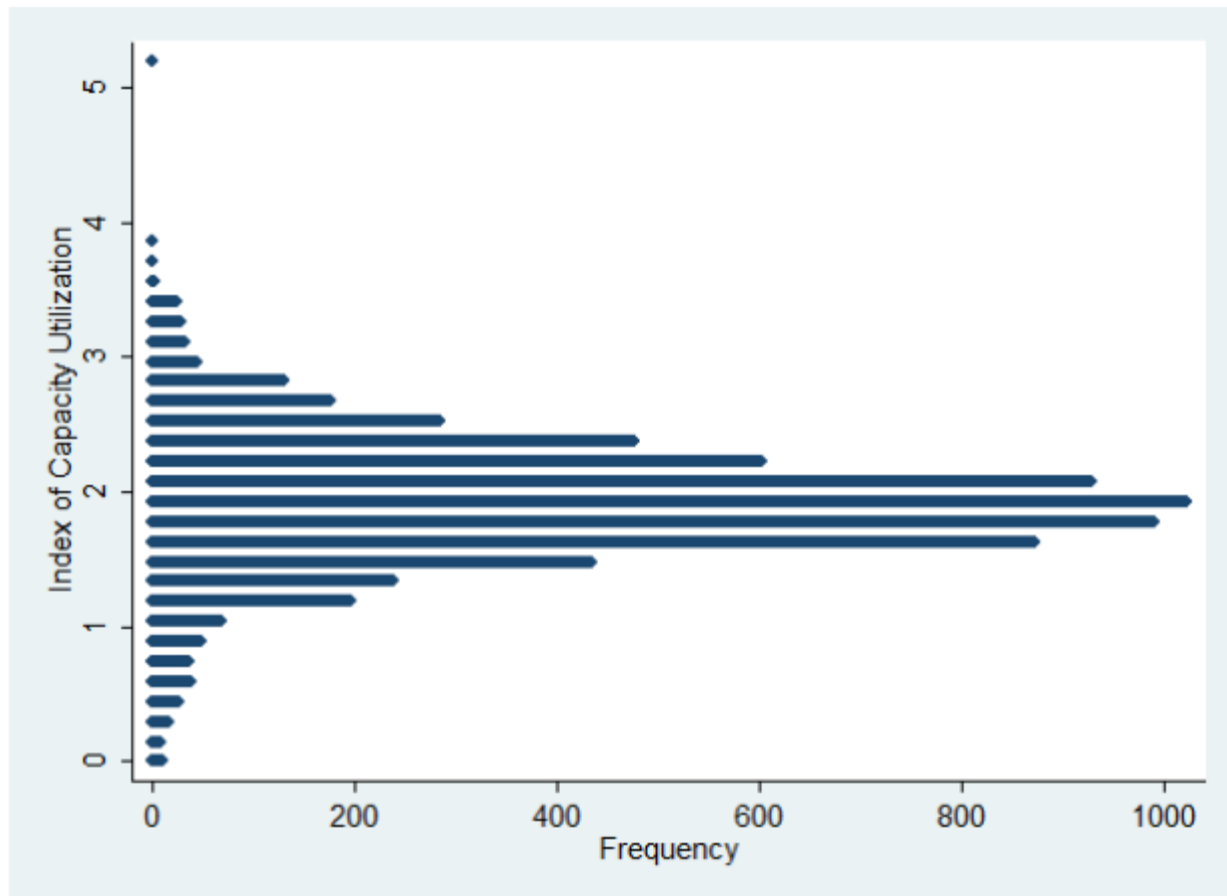
$$cap - util_i = \frac{\sum_{t=2}^{n-1} Y_{it}^e}{(n - 2) * K_i}$$

Y – Energy Yield

K – Rated Turbine Capacity

n – Number of full years of turbine operation

Indeks av Kapasitetsutnyttelse



Cox Regresjonsmodell

$$H(t_i) = H_0(t)e^{\beta X + \epsilon}$$

$H(t_i)$ – estimated hazard at life-time, t , for turbine i

H_0 – Baseline hazard

X – factors that affect

t - "age" of turbine

Resultater, Cox regresjonsmodell

+1 KUI -> 9% økt
risiko for
nedleggelse

	I No Install Year	II Install Year ¹ Dummies	III Time ¹ interaction
cap-util	1.333 (.051)	1.089 (.045)	1.097 (.046)
capacity	0.818 (.027)	0.671 (.030)	0.978 ² (.003)
capacity2	1.009 (.001)	1.013 (.001)	n/a
under150	1.850 (.141)	1.574 (.122)	1.022 ² (.005)
west	1.473 (.083)	1.471 (.084)	1.469 (.083)

Standard errors in parenthesis

¹ *estimated coefficients on install-year dummies omitted*

² *interacted with analysis time in year-units*

6754 Observations, 2279 Failures

Resultater, Cox regresjonsmodell

+1 KUI -> 33% økt
risiko for
nedleggelse

	I No Install Year	II Install Year ¹ Dummies	III Time ¹ interaction
cap-util	1.333 (.051)	1.089 (.045)	1.097 (.046)
capacity	0.818 (.027)	0.671 (.030)	0.978 ² (.003)
capacity2	1.009 (.001)	1.013 (.001)	n/a
under150	1.850 (.141)	1.574 (.122)	1.022 ² (.005)
west	1.473 (.083)	1.471 (.084)	1.469 (.083)

Standard errors in parenthesis

¹ *estimated coefficients on install-year dummies omitted*

² *interacted with analysis time in year-units*

6754 Observations, 2279 Failures

Resultater, Cox regresjonsmodell

+100kw -> 50%
mindre risiko for
nedleggelse

	I No Install Year	II Install Year ¹ Dummies	III Time ¹ interaction
cap-util	1.333 (.051)	1.089 (.045)	1.097 (.046)
capacity	0.818 (.027)	0.671 (.030)	0.978 ² (.003)
capacity2	1.009 (.001)	1.013 (.001)	n/a
under150	1.850 (.141)	1.574 (.122)	1.022 ² (.005)
west	1.473 (.083)	1.471 (.084)	1.469 (.083)

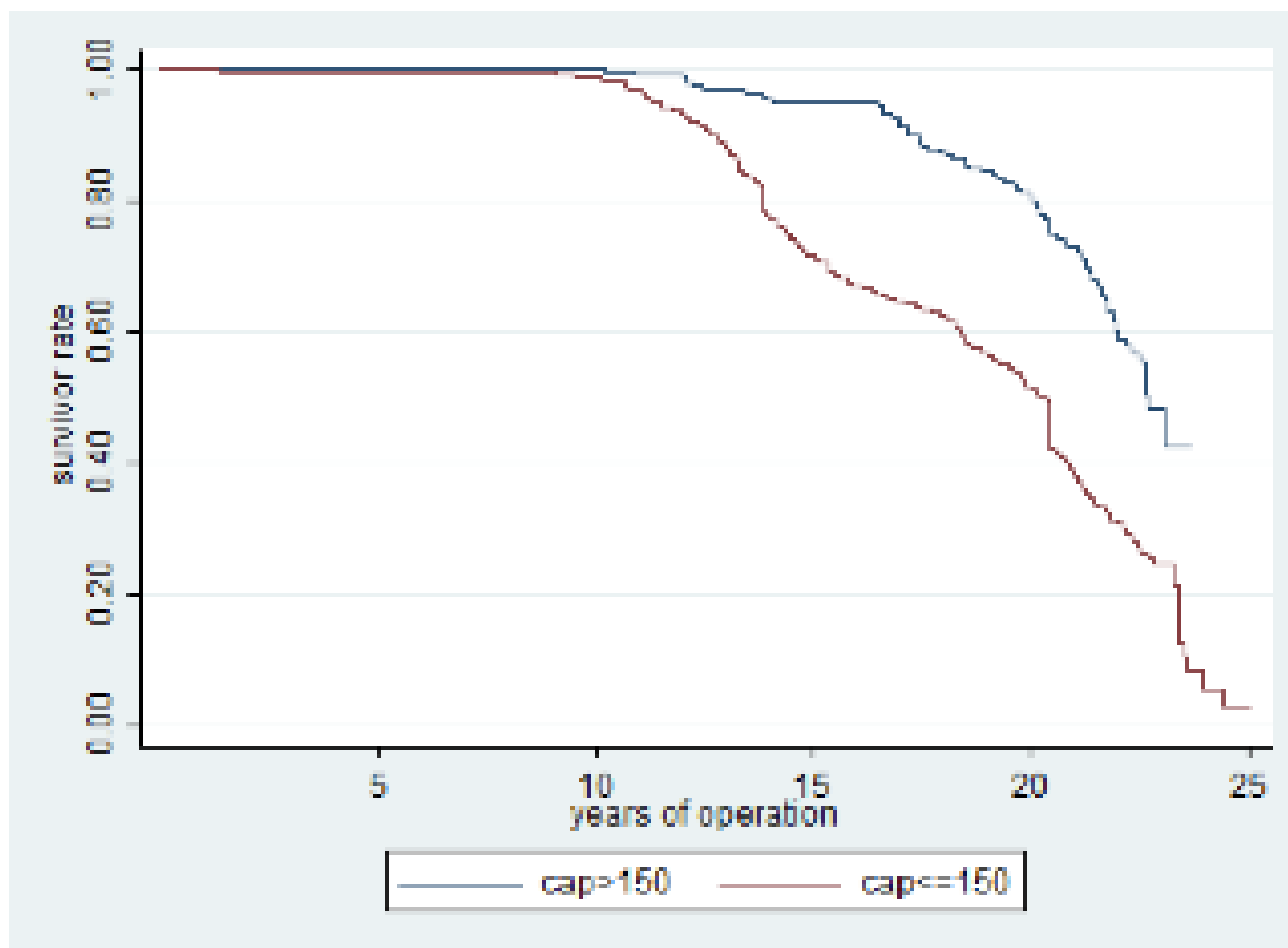
Standard errors in parenthesis

¹ *estimated coefficients on install-year dummies omitted*

² *interacted with analysis time in year-units*

6754 Observations, 2279 Failures

Virkning av “scrapping”-politikk



Resultater, Cox regresjonsmodell

	I No Install Year	II Install Year ¹ Dummies	III Time ¹ interaction
cap-util	1.333 (.051)	1.089 (.045)	1.097 (.046)
capacity	0.818 (.027)	0.671 (.030)	0.978 ² (.003)
capacity2	1.009 (.001)	1.013 (.001)	n/a
under150	1.850 (.141)	1.574 (.122)	1.022 ² (.005)
west	1.473 (.083)	1.471 (.084)	1.469 (.083)

-> 50% - 80% økt
risiko for nedleggelse

Standard errors in parenthesis

¹ *estimated coefficients on install-year dummies omitted*

² *interacted with analysis time in year-units*

6754 Observations, 2279 Failures

Resultater, Cox regresjonsmodell

	I	II	III
	No Install	Install Year ¹	Time ¹
	Year	Dummies	interaction
cap-util	1.333 (.051)	1.089 (.045)	1.097 (.046)
capacity	0.818 (.027)	0.671 (.030)	0.978 ² (.003)
capacity2	1.009 (.001)	1.013 (.001)	n/a
under150	1.850 (.141)	1.574 (.122)	1.022 ² (.005)
west	1.473 (.083)	1.471 (.084)	1.469 (.083)

Standard errors in parenthesis

¹ *estimated coefficients on install-year dummies omitted*

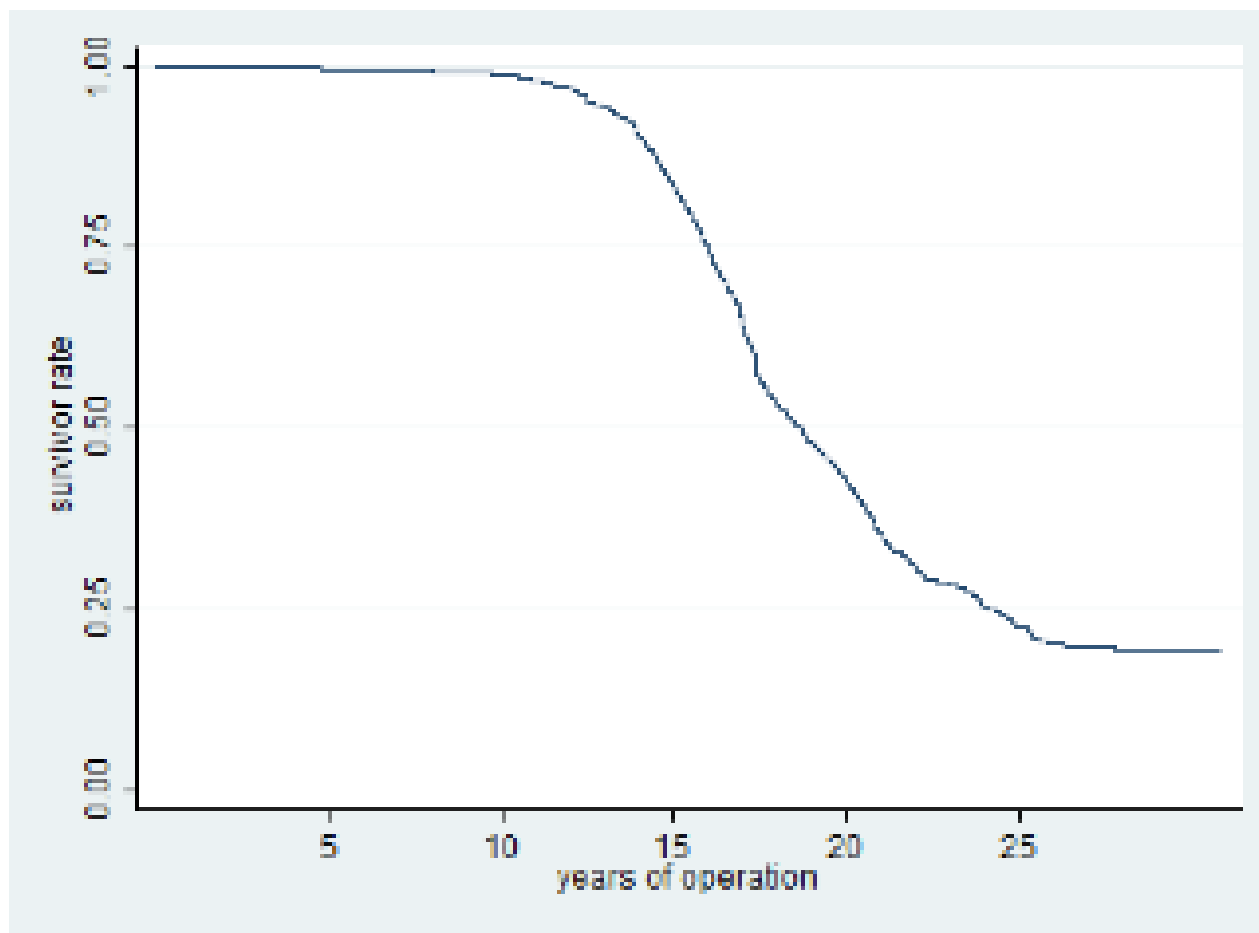
² *interacted with analysis time in year-units*

6754 Observations, 2279 Failures

+100kw -> 50%
mindre risiko for
nedleggelse

Konklusjon, Diskusjon og Spørsmål

Kaplan-Meier Estimate of Survival Function



Effect of second scrapping policy

