



1991

Sweden started the work with source separation to WWTP's and adopted a policy for connections to municipal sewage plants. Only material that could be treated in WWTP's, without polluting the sludge, should enter the sewage pipes.

1993

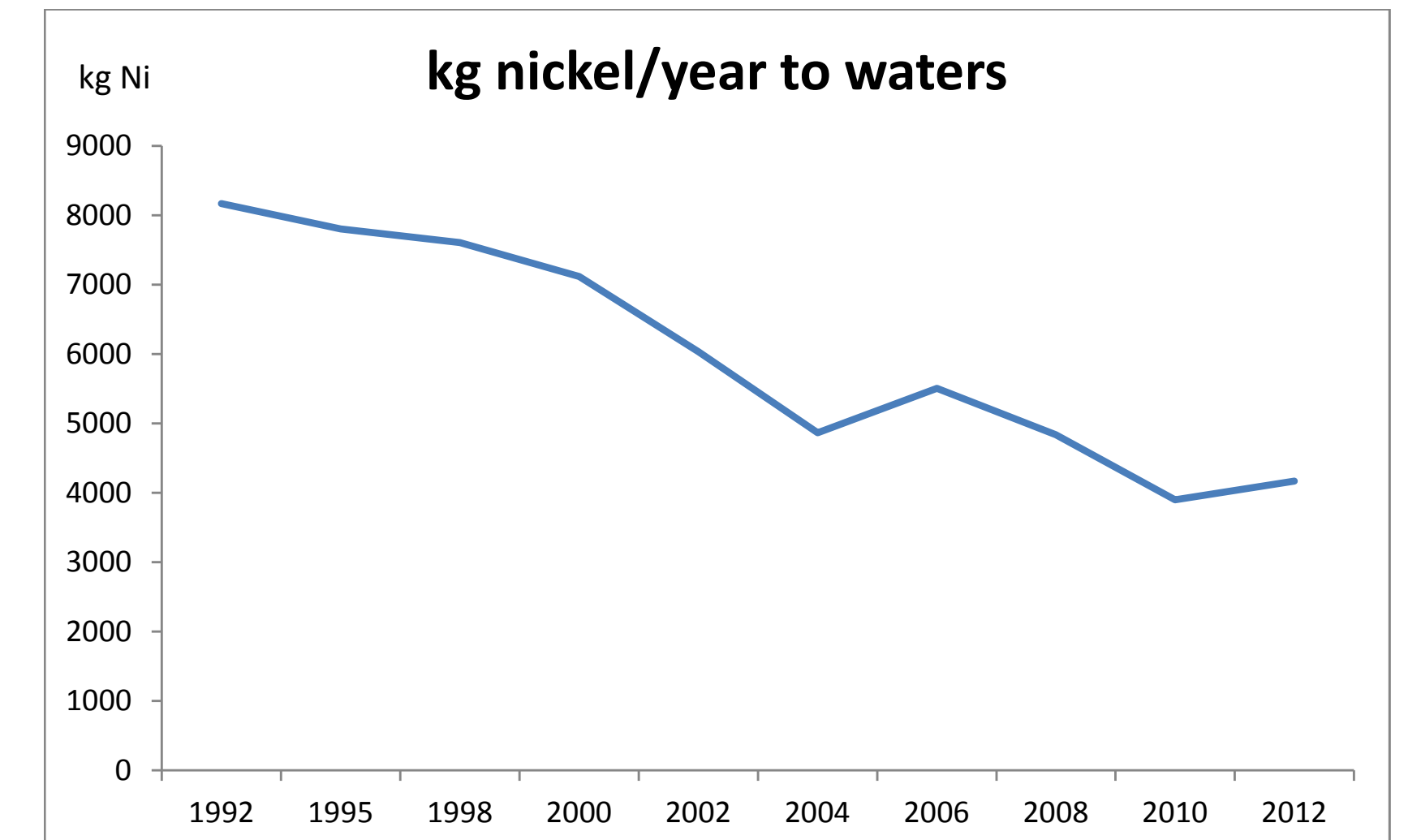
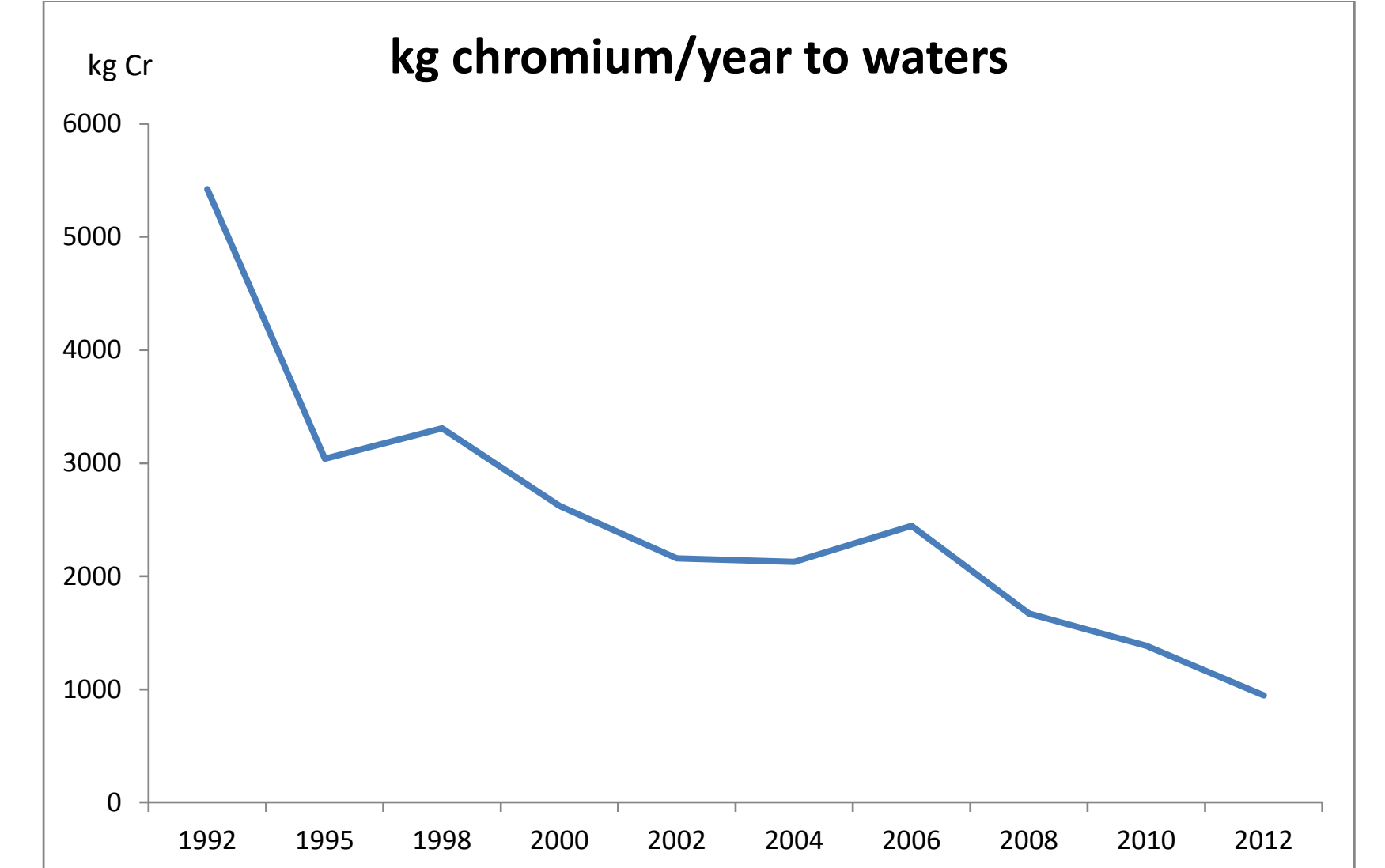
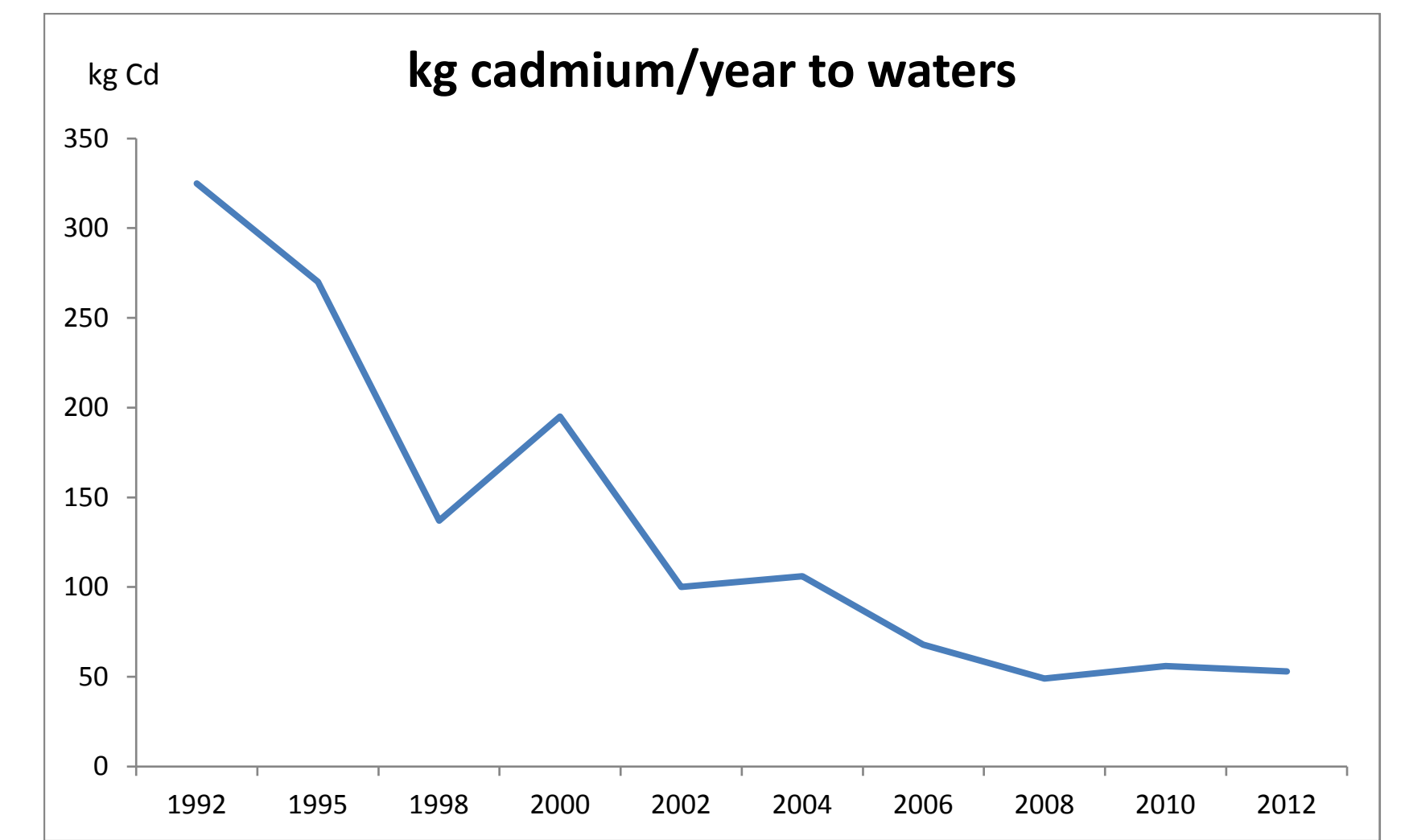
The first audit of sludge took place.

1994

A sludge agreement was signed between Swedish EPA, The Swedish Water & Wastewater Association and the Federation of Swedish Farmers, concerning the connection policy for WWTP and the quality on sludge.



Metal discharges to water from municipal WWTP's, Sweden (kg/year). 1992-2012



Cadmium in relation to phosphorus

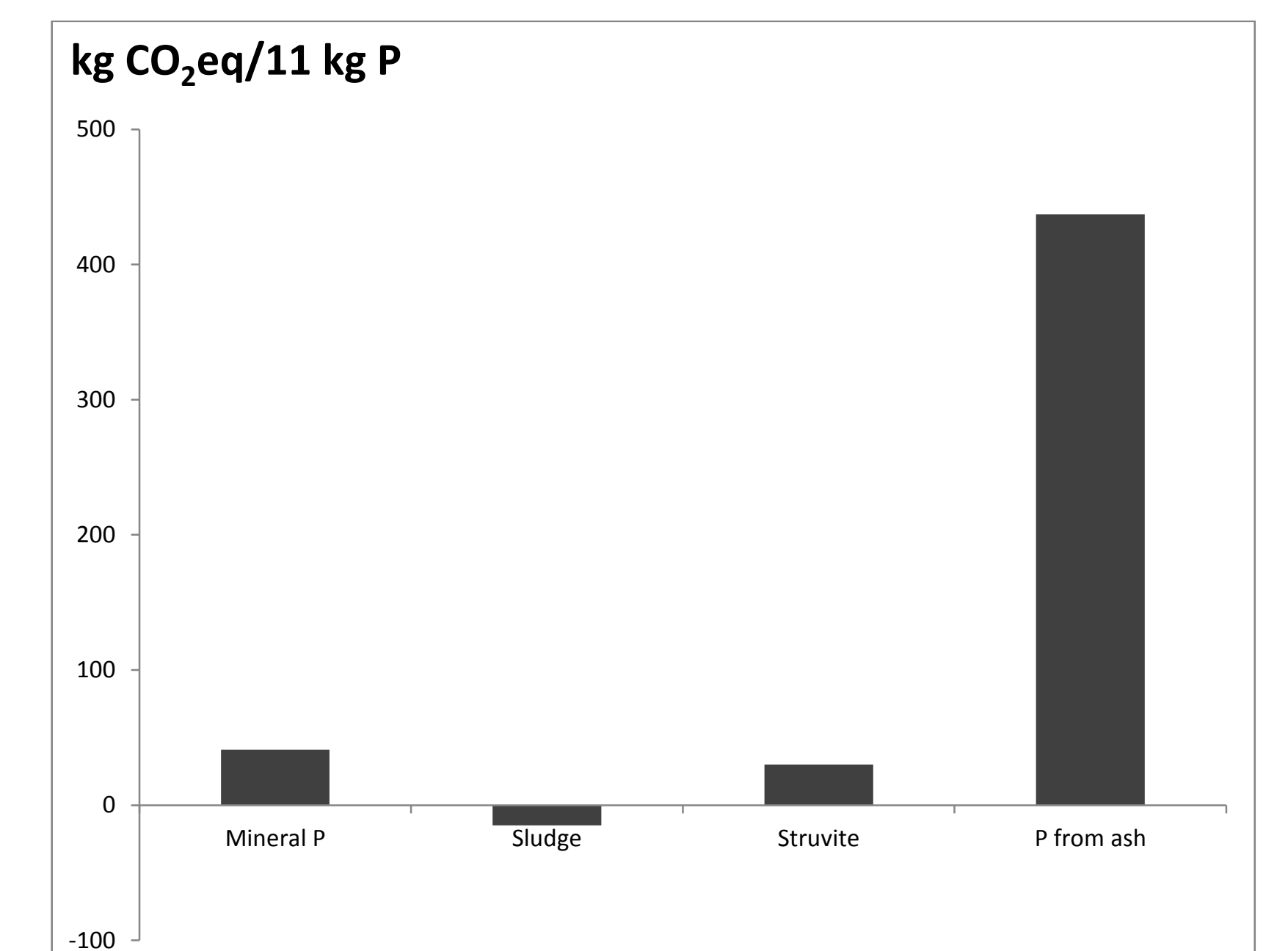
	mg Cd/kg P
Average Sw. sludge, 1995	54
Average Sw. sludge, 2010	32
Average Sw. sludge, 2012*	37
Mineral fertilizer used in Sweden	<5
Mineral fertilizer used in EU**	87

*The increase since 2010 is probably due to the ban on phosphates in detergents
** Nziguheba G., Smolders E. 2008.

Metals in average Swedish sludge mg/kg DM

	1985	2012
Cd	2,6	1
Cr	85	28
Cu	470	353
Hg	3,6	0,6
Ni	50	17
Pb	100	22
Zn	850	601

Emissions of greenhouse gases for 11 kg P in a LCA for different sources of phosphorus (mineral fertilizer, sludge to farmland, struvite, P recovery from ash). The negative value for sludge is due to the crediting for the content of nitrogen in sludge.



Linderholm, K., Tillman, A.M. & Mattsson J.E. (2012). Life cycle assessment of phosphorus alternatives for Swedish agriculture. Resources, Conservation and Recycling



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