

ECRAN Regional Training Seminar on the Assessment of  
GHG Inventories in the Energy and Industrial Processes Sectors  
Activity 3.2: MMR - Task 3.2.2.A  
Zagreb, Croatia, 19 November 2014

**Practical approach in handling the CRF tables -  
Industrial processes**

Andrea Hublin



This Project is funded by the European Union



Project implemented by Human Dynamics  
Consortium

# Outline

- inventory preparation
    - ✓ AD collection - different sources
    - ✓ choice of method, EFs and AD
    - ✓ emission estimates
  - **how to start working with CRF?**
  - examples of spreadsheets
  - preparation of “meta CRF table”
  - **how to fill in the CRF tables?**
- TACCC principles
- ✓ transparency
  - ✓ accuracy
  - ✓ completeness
  - ✓ comparability
  - ✓ consistency



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# Table 2(I)s1 - sectoral report for IPPU

**TABLE 2(I) SECTORAL REPORT FOR INDUSTRIAL PROCESSES AND PRODUCT USE**  
(Sheet 1 of 2)

Year  
Submission  
Country

GREENHOUSE GAS SOURCE AND SINK CATEG	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs "	PFCs "	Unspecified mix of HFCs and PFCs "	SF <sub>6</sub>	NF <sub>3</sub>	NO <sub>x</sub>	CO	NMVOC	SO <sub>2</sub>
	(kt)			CO <sub>2</sub> equivalent (kt)			(kt)					
<b>Total industrial processes</b>												
<b>A. Mineral industry</b>												
1. Cement production												
2. Lime production												
3. Glass production												
4. Other process uses of carbonates												
<b>B. Chemical industry</b>												
1. Ammonia production												
2. Nitric acid production												
3. Adipic acid production												
4. Caprolactam, glyoxal and glyoxylic acid production												
5. Carbide production												
6. Titanium dioxide production												
7. Soda ash production												
8. Petrochemical and carbon black production												
9. Fluorochemical production												
10. Other (as specified in table 2(I).A-H)												
<b>C. Metal industry</b>												
1. Iron and steel production												
2. Ferroalloys production												
3. Aluminium production												
4. Magnesium production												
5. Lead production												
6. Zinc production												
7. Other (as specified in table 2(I).A-H)												



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# Table 2(I)s2 - sectoral report for IPPU

TABLE 2(I) SECTORAL REPORT FOR INDUSTRIAL PROCESSES AND PRODUCT USE  
(Sheet 2 of 2)

Year  
Submission  
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs <sup>1)</sup>	PFCs <sup>1)</sup>	Unspecified mix of HFCs and PFCs <sup>1)</sup>	SF <sub>6</sub>	NF <sub>3</sub>	NO <sub>x</sub>	CO	NM VOC	SO <sub>2</sub>
	(kt)			CO <sub>2</sub> equivalent (kt)			(kt)					
<b>D. Non-energy products from fuels and solvent use</b>												
1. Lubricant use												
2. Paraffin wax use												
3. Other												
<b>E. Electronics industry</b>												
1. Integrated circuit or semiconductor												
2. TFT flat panel display												
3. Photovoltaics												
4. Heat transfer fluid												
5. Other (as specified in table 2(II))												
<b>F. Product uses as substitutes for ODS <sup>1)</sup></b>												
1. Refrigeration and air conditioning												
2. Foam blowing agents												
3. Fire protection												
4. Aerosols												
5. Solvents												
6. Other applications												
<b>G. Other product manufacture and use</b>												
1. Electrical equipment												
2. SF <sub>6</sub> and PFCs from other product use												
3. N <sub>2</sub> O from product uses												
4. Other												
<b>H. Other (as specified in tables 2(I).A-H and 2(II)) <sup>1)</sup></b>												



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## Table 2(II) - sectoral report for IPPU - emissions of HFCs, PFCs, SF<sub>6</sub> and NF<sub>3</sub>



TABLE 2(H) SECTORAL REPORT FOR INDUSTRIAL PROCESSES AND PRODUCT USE - EMISSIONS OF HFCs, PFCs, SF<sub>6</sub> AND NF<sub>3</sub>  
(Sheet 1 of 1)

EXERCISES GAS SOURCE AND LINE CATEGORIES	BFC-10	BFC-12	BFC-14	BFC-16-18-20-22	BFC-105	BFC-106	BFC-107a	BFC-107b	BFC-108	BFC-109	BFC-110	BFC-111a	BFC-111b	BFC-112	BFC-113a	BFC-113b	BFC-114	BFC-115a	BFC-115b	BFC-116a	BFC-116b	BFC-117a	BFC-117b	BFC-118a	BFC-118b	BFC-119a	BFC-119b	BFC-120a	BFC-120b	BFC-121a	BFC-121b	BFC-122a	BFC-122b	BFC-123a	BFC-123b	BFC-124a	BFC-124b	BFC-125a	BFC-125b	BFC-126a	BFC-126b	BFC-127a	BFC-127b	BFC-128a	BFC-128b	BFC-129a	BFC-129b	BFC-130a	BFC-130b	BFC-131a	BFC-131b	BFC-132a	BFC-132b	BFC-133a	BFC-133b	BFC-134a	BFC-134b	BFC-135a	BFC-135b	BFC-136a	BFC-136b	BFC-137a	BFC-137b	BFC-138a	BFC-138b	BFC-139a	BFC-139b	BFC-140a	BFC-140b	BFC-141a	BFC-141b	BFC-142a	BFC-142b	BFC-143a	BFC-143b	BFC-144a	BFC-144b	BFC-145a	BFC-145b	BFC-146a	BFC-146b	BFC-147a	BFC-147b	BFC-148a	BFC-148b	BFC-149a	BFC-149b	BFC-150a	BFC-150b	BFC-151a	BFC-151b	BFC-152a	BFC-152b	BFC-153a	BFC-153b	BFC-154a	BFC-154b	BFC-155a	BFC-155b	BFC-156a	BFC-156b	BFC-157a	BFC-157b	BFC-158a	BFC-158b	BFC-159a	BFC-159b	BFC-160a	BFC-160b	BFC-161a	BFC-161b	BFC-162a	BFC-162b	BFC-163a	BFC-163b	BFC-164a	BFC-164b	BFC-165a	BFC-165b	BFC-166a	BFC-166b	BFC-167a	BFC-167b	BFC-168a	BFC-168b	BFC-169a	BFC-169b	BFC-170a	BFC-170b	BFC-171a	BFC-171b	BFC-172a	BFC-172b	BFC-173a	BFC-173b	BFC-174a	BFC-174b	BFC-175a	BFC-175b	BFC-176a	BFC-176b	BFC-177a	BFC-177b	BFC-178a	BFC-178b	BFC-179a	BFC-179b	BFC-180a	BFC-180b	BFC-181a	BFC-181b	BFC-182a	BFC-182b	BFC-183a	BFC-183b	BFC-184a	BFC-184b	BFC-185a	BFC-185b	BFC-186a	BFC-186b	BFC-187a	BFC-187b	BFC-188a	BFC-188b	BFC-189a	BFC-189b	BFC-190a	BFC-190b	BFC-191a	BFC-191b	BFC-192a	BFC-192b	BFC-193a	BFC-193b	BFC-194a	BFC-194b	BFC-195a	BFC-195b	BFC-196a	BFC-196b	BFC-197a	BFC-197b	BFC-198a	BFC-198b	BFC-199a	BFC-199b	BFC-200a	BFC-200b	BFC-201a	BFC-201b	BFC-202a	BFC-202b	BFC-203a	BFC-203b	BFC-204a	BFC-204b	BFC-205a	BFC-205b	BFC-206a	BFC-206b	BFC-207a	BFC-207b	BFC-208a	BFC-208b	BFC-209a	BFC-209b	BFC-210a	BFC-210b	BFC-211a	BFC-211b	BFC-212a	BFC-212b	BFC-213a	BFC-213b	BFC-214a	BFC-214b	BFC-215a	BFC-215b	BFC-216a	BFC-216b	BFC-217a	BFC-217b	BFC-218a	BFC-218b	BFC-219a	BFC-219b	BFC-220a	BFC-220b	BFC-221a	BFC-221b	BFC-222a	BFC-222b	BFC-223a	BFC-223b	BFC-224a	BFC-224b	BFC-225a	BFC-225b	BFC-226a	BFC-226b	BFC-227a	BFC-227b	BFC-228a	BFC-228b	BFC-229a	BFC-229b	BFC-230a	BFC-230b	BFC-231a	BFC-231b	BFC-232a	BFC-232b	BFC-233a	BFC-233b	BFC-234a	BFC-234b	BFC-235a	BFC-235b	BFC-236a	BFC-236b	BFC-237a	BFC-237b	BFC-238a	BFC-238b	BFC-239a	BFC-239b	BFC-240a	BFC-240b	BFC-241a	BFC-241b	BFC-242a	BFC-242b	BFC-243a	BFC-243b	BFC-244a	BFC-244b	BFC-245a	BFC-245b	BFC-246a	BFC-246b	BFC-247a	BFC-247b	BFC-248a	BFC-248b	BFC-249a	BFC-249b	BFC-250a	BFC-250b	BFC-251a	BFC-251b	BFC-252a	BFC-252b	BFC-253a	BFC-253b	BFC-254a	BFC-254b	BFC-255a	BFC-255b	BFC-256a	BFC-256b	BFC-257a	BFC-257b	BFC-258a	BFC-258b	BFC-259a	BFC-259b	BFC-260a	BFC-260b	BFC-261a	BFC-261b	BFC-262a	BFC-262b	BFC-263a	BFC-263b	BFC-264a	BFC-264b	BFC-265a	BFC-265b	BFC-266a	BFC-266b	BFC-267a	BFC-267b	BFC-268a	BFC-268b	BFC-269a	BFC-269b	BFC-270a	BFC-270b	BFC-271a	BFC-271b	BFC-272a	BFC-272b	BFC-273a	BFC-273b	BFC-274a	BFC-274b	BFC-275a	BFC-275b	BFC-276a	BFC-276b	BFC-277a	BFC-277b	BFC-278a	BFC-278b	BFC-279a	BFC-279b	BFC-280a	BFC-280b	BFC-281a	BFC-281b	BFC-282a	BFC-282b	BFC-283a	BFC-283b	BFC-284a	BFC-284b	BFC-285a	BFC-285b	BFC-286a	BFC-286b	BFC-287a	BFC-287b	BFC-288a	BFC-288b	BFC-289a	BFC-289b	BFC-290a	BFC-290b	BFC-291a	BFC-291b	BFC-292a	BFC-292b	BFC-293a	BFC-293b	BFC-294a	BFC-294b	BFC-295a	BFC-295b	BFC-296a	BFC-296b	BFC-297a	BFC-297b	BFC-298a	BFC-298b	BFC-299a	BFC-299b	BFC-300a	BFC-300b	BFC-301a	BFC-301b	BFC-302a	BFC-302b	BFC-303a	BFC-303b	BFC-304a	BFC-304b	BFC-305a	BFC-305b	BFC-306a	BFC-306b	BFC-307a	BFC-307b	BFC-308a	BFC-308b	BFC-309a	BFC-309b	BFC-310a	BFC-310b	BFC-311a	BFC-311b	BFC-312a	BFC-312b	BFC-313a	BFC-313b	BFC-314a	BFC-314b	BFC-315a	BFC-315b	BFC-316a	BFC-316b	BFC-317a	BFC-317b	BFC-318a	BFC-318b	BFC-319a	BFC-319b	BFC-320a	BFC-320b	BFC-321a	BFC-321b	BFC-322a	BFC-322b	BFC-323a	BFC-323b	BFC-324a	BFC-324b	BFC-325a	BFC-325b	BFC-326a	BFC-326b	BFC-327a	BFC-327b	BFC-328a	BFC-328b	BFC-329a	BFC-329b	BFC-330a	BFC-330b	BFC-331a	BFC-331b	BFC-332a	BFC-332b	BFC-333a	BFC-333b	BFC-334a	BFC-334b	BFC-335a	BFC-335b	BFC-336a	BFC-336b	BFC-337a	BFC-337b	BFC-338a	BFC-338b	BFC-339a	BFC-339b	BFC-340a	BFC-340b	BFC-341a	BFC-341b	BFC-342a	BFC-342b	BFC-343a	BFC-343b	BFC-344a	BFC-344b	BFC-345a	BFC-345b	BFC-346a	BFC-346b	BFC-347a	BFC-347b	BFC-348a	BFC-348b	BFC-349a	BFC-349b	BFC-350a	BFC-350b	BFC-351a	BFC-351b	BFC-352a	BFC-352b	BFC-353a	BFC-353b	BFC-354a	BFC-354b	BFC-355a	BFC-355b	BFC-356a	BFC-356b	BFC-357a	BFC-357b	BFC-358a	BFC-358b	BFC-359a	BFC-359b	BFC-360a	BFC-360b	BFC-361a	BFC-361b	BFC-362a	BFC-362b	BFC-363a	BFC-363b	BFC-364a	BFC-364b	BFC-365a	BFC-365b	BFC-366a	BFC-366b	BFC-367a	BFC-367b	BFC-368a	BFC-368b	BFC-369a	BFC-369b	BFC-370a	BFC-370b	BFC-371a	BFC-371b	BFC-372a	BFC-372b	BFC-373a	BFC-373b	BFC-374a	BFC-374b	BFC-375a	BFC-375b	BFC-376a	BFC-376b	BFC-377a	BFC-377b	BFC-378a	BFC-378b	BFC-379a	BFC-379b	BFC-380a	BFC-380b	BFC-381a	BFC-381b	BFC-382a	BFC-382b	BFC-383a	BFC-383b	BFC-384a	BFC-384b	BFC-385a	BFC-385b	BFC-386a	BFC-386b	BFC-387a	BFC-387b	BFC-388a	BFC-388b	BFC-389a	BFC-389b	BFC-390a	BFC-390b	BFC-391a	BFC-391b	BFC-392a	BFC-392b	BFC-393a	BFC-393b	BFC-394a	BFC-394b	BFC-395a	BFC-395b	BFC-396a	BFC-396b	BFC-397a	BFC-397b	BFC-398a	BFC-398b	BFC-399a	BFC-399b	BFC-400a	BFC-400b	BFC-401a	BFC-401b	BFC-402a	BFC-402b	BFC-403a	BFC-403b	BFC-404a	BFC-404b	BFC-405a	BFC-405b	BFC-406a	BFC-406b	BFC-407a	BFC-407b	BFC-408a	BFC-408b	BFC-409a	BFC-409b	BFC-410a	BFC-410b	BFC-411a	BFC-411b	BFC-412a	BFC-412b	BFC-413a	BFC-413b	BFC-414a	BFC-414b	BFC-415a	BFC-415b	BFC-416a	BFC-416b	BFC-417a	BFC-417b	BFC-418a	BFC-418b	BFC-419a	BFC-419b	BFC-420a	BFC-420b	BFC-421a	BFC-421b	BFC-422a	BFC-422b	BFC-423a	BFC-423b	BFC-424a	BFC-424b	BFC-425a	BFC-425b	BFC-426a	BFC-426b	BFC-427a	BFC-427b	BFC-428a	BFC-428b	BFC-429a	BFC-429b	BFC-430a	BFC-430b	BFC-431a	BFC-431b	BFC-432a	BFC-432b	BFC-433a	BFC-433b	BFC-434a	BFC-434b	BFC-435a	BFC-435b	BFC-436a	BFC-436b	BFC-437a	BFC-437b	BFC-438a	BFC-438b	BFC-439a	BFC-439b	BFC-440a	BFC-440b	BFC-441a	BFC-441b	BFC-442a	BFC-442b	BFC-443a	BFC-443b	BFC-444a	BFC-444b	BFC-445a	BFC-445b	BFC-446a	BFC-446b	BFC-447a	BFC-447b	BFC-448a	BFC-448b	BFC-449a	BFC-449b	BFC-450a	BFC-450b	BFC-451a	BFC-451b	BFC-452a	BFC-452b	BFC-453a	BFC-453b	BFC-454a	BFC-454b	BFC-455a	BFC-455b	BFC-456a	BFC-456b	BFC-457a	BFC-457b	BFC-458a	BFC-458b	BFC-459a	BFC-459b	BFC-460a	BFC-460b	BFC-461a	BFC-461b	BFC-462a	BFC-462b	BFC-463a	BFC-463b	BFC-464a	BFC-464b	BFC-465a	BFC-465b	BFC-466a	BFC-466b	BFC-467a	BFC-467b	BFC-468a	BFC-468b	BFC-469a	BFC-469b	BFC-470a	BFC-470b	BFC-471a	BFC-471b	BFC-472a	BFC-472b	BFC-473a	BFC-473b	BFC-474a	BFC-474b	BFC-475a	BFC-475b	BFC-476a	BFC-476b	BFC-477a	BFC-477b	BFC-478a	BFC-478b	BFC-479a	BFC-479b	BFC-480a	BFC-480b	BFC-481a	BFC-481b	BFC-482a	BFC-482b	BFC-483a	BFC-483b	BFC-484a	BFC-484b	BFC-485a	BFC-485b	BFC-486a	BFC-486b	BFC-487a	BFC-487b	BFC-488a	BFC-488b	BFC-489a	BFC-489b	BFC-490a	BFC-490b	BFC-491a	BFC-491b	BFC-492a	BFC-492b	BFC-493a	BFC-493b	BFC-494a	BFC-494b	BFC-495a	BFC-495b	BFC-496a	BFC-496b	BFC-497a	BFC-497b	BFC-498a	BFC-498b	BFC-499a	BFC-499b	BFC-500a	BFC-500b	BFC-501a	BFC-501b	BFC-502a	BFC-502b	BFC-503a	BFC-503b	BFC-504a	BFC-504b	BFC-505a	BFC-505b	BFC-506a	BFC-506b	BFC-507a	BFC-507b	BFC-508a	BFC-508b	BFC-509a	BFC-509b	BFC-510a	BFC-510b	BFC-511a	BFC-511b	BFC-512a	BFC-512b	BFC-513a	BFC-513b	BFC-514a	BFC-514b	BFC-515a	BFC-515b	BFC-516a	BFC-516b	BFC-517a	BFC-517b	BFC-518a	BFC-518b	BFC-519a	BFC-519b	BFC-520a	BFC-520b	BFC-521a	BFC-521b	BFC-522a	BFC-522b	BFC-523a	BFC-523b	BFC-524a	BFC-524b	BFC-525a	BFC-525b	BFC-526a	BFC-526b	BFC-527a	BFC-527b	BFC-528a	BFC-528b	BFC-529a	BFC-529b	BFC-530a	BFC-530b	BFC-531a	BFC-531b	BFC-532a	BFC-532b	BFC-533a	BFC-533b	BFC-534a	BFC-534b	BFC-535a	BFC-535b	BFC-536a	BFC-536b	BFC-537a	BFC-537b	BFC-538a	BFC-538b	BFC-539a	BFC-539b	BFC-540a	BFC-540b	BFC-541a	BFC-541b	BFC-542a	BFC-542b	BFC-543a	BFC-543b	BFC-544a	BFC-544b	BFC-545a	BFC-545b	BFC-546a	BFC-546b	BFC-547a	BFC-547b	BFC-548a	BFC-548b	BFC-549a	BFC-549b	BFC-550a	BFC-550b	BFC-551a	BFC-551b	BFC-552a	BFC-552b	BFC-553a	BFC-553b	BFC-554a	BFC-554b	BFC-555a	BFC-555b	BFC-556a	BFC-556b	BFC-557a	BFC-557b	BFC-558a	BFC-558b	BFC-559a	BFC-559b	BFC-560a	BFC-560b	BFC-561a	BFC-561b	BFC-562a	BFC-562b	BFC-563a	BFC-563b	BFC-564a	BFC-564b	BFC-565a	BFC-565b	BFC-566a	BFC-566b	BFC-567a	BFC-567b	BFC-568a	BFC-568b	BFC-569a	BFC-569b	BFC-570a	BFC-570b	BFC-571a	BFC-571b	BFC-572a	BFC-572b	BFC-573a	BFC-573b	BFC-574a	BFC-574b	BFC-575a	BFC-575b	BFC-576a	BFC-576b	BFC-577a	BFC-577b	BFC-578a	BFC-578b	BFC-579a	BFC-579b	BFC-580a	BFC-580b	BFC-581a	BFC-581b	BFC-582a	BFC-582b	BFC-583a	BFC-583b	BFC-584a	BFC-584b	BFC-585a	BFC-585b	BFC-586a	BFC-586b	BFC-587a	BFC-587b	BFC-588a	BFC-588b	BFC-589a	BFC-589b	BFC-590a	BFC-590b	BFC-591a	BFC-591b	BFC-592a	BFC-592b	BFC-593a	BFC-593b	BFC-594a	BFC-594b	BFC-595a	BFC-595b	BFC-596a	BFC-596b	BFC-597a	BFC-597b	BFC-598a	BFC-598b	BFC-599a	BFC-599b	BFC-600a	BFC-600b	BFC-601a	BFC-601b	BFC-602a	BFC-602b	BFC-603a	BFC-603b	BFC-604a	BFC-604b	BFC-605a	BFC-605b	BFC-606a	BFC-606b	BFC-607a	BFC-607b	BFC-608a	BFC-608b	BFC-609a	BFC-609b	BFC-610a	BFC-610b	BFC-611a	BFC-611b	BFC-612a	BFC-612b	BFC-613a	BFC-613b	BFC-614a	BFC-614b	BFC-615a	BFC-615b	BFC-616a	BFC-616b	BFC-617a	BFC-617b	BFC-618a	BFC-618b	BFC-619a	BFC-619b	BFC-620a	BFC-620b	BFC-621a	BFC-621b	BFC-622a	BFC-622b	BFC-623a	BFC-623b	BFC-624a	BFC-624b	BFC-625a	BFC-625b	BFC-626a	BFC-626b	BFC-627a	BFC-627b	BFC-628a	BFC-628b	BFC-629a	BFC-629b	BFC-630a	BFC-630b	BFC-631a	BFC-631b	BFC-632a	BFC-632b	BFC-633a	BFC-633b	BFC-634a	BFC-634b	BFC-635a	BFC-635b	BFC-636a	BFC-636b	BFC-637a	BFC-637b	BFC-638a	BFC-638b	BFC-639a	BFC-639b	BFC-640a	BFC-640b	BFC-641a	BFC-641b	BFC-642a	BFC-642b	BFC-643a	BFC-643b	BFC-644a	BFC-644b	BFC-645a	BFC-645b	BFC-646a	BFC-646b	BFC-647a	BFC-647b	BFC-648a	BFC-648b	BFC-649a	BFC-649b	BFC-650a	BFC-650b	BFC-651a	BFC-651b	BFC-652a	BFC-652b	BFC-653a	BFC-653b	BFC-654a	BFC-654b	BFC-655a	BFC-655b	BFC-656a	BFC-656b	BFC-657a	BFC-657b	BFC-658a	BFC-658b	BFC-659a	BFC-659b	BFC-660a	BFC-660b	BFC-661a	BFC-661b	BFC-662a	BFC-662b	BFC-663a	BFC-663b	BFC-664a	BFC-664b	BFC-665a	BFC-665b	BFC-666a	BFC-666b	BFC-667a	BFC-667b	BFC-668a	BFC-
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# Choice of method, EFs and AD

## Example: 2.A Mineral Industry/2.A.1 Cement Production

- Tier 1 method
  - ✓ use of cement production data - national level
  - ✓ use of default EFs (CaO composition, correction factor for CKD)
- Tier 2 method
  - ✓ use of clinker production data - country/plant specific data
  - ✓ country/plant specific EFs
- Tier 3 method
  - ✓ use of carbonates input data - disaggregated plant specific data on compositions and quantities of carbonates
  - ✓ plant specific EFs - full accounting of carbonates (species and sources)



# Preparation of subsectoral spreadsheets (1)

## Plant-specific data, Tier 2 method

Clinker and Cement Production		2007	2008	2009	2010	2011	2012
Clinker bought	[t/yr]	0	0	0	0	0	0
Clinker sold	[t/yr]	0	6,395	3,601	21,607	65,082	70,186
Clinker send off	[t/yr]	0	0	0	0	0	0
Change in clinker stocks	[t/yr]	10,752	25,252	511	-20,281	-10,388	32,614
Total clinker consumed	[t/yr]	486,730	443,919	402,820	348,667	350,254	307,713
<b>Mineral components (MIC) used to produce blended cements (dry weight):</b>							
Gypsum	[t/yr]	28,071	26,360	21,826	14,370	17,254	17,808
Limestone	[t/yr]	34,659	22,532	26,374	19,096	23,622	29,926
Slag	[t/yr]	82,822	62,924	56,335	35,488	43,729	38,333
Fly ash (for blending)	[t/yr]	56,201	65,409	38,276	34,826	42,676	33,473
Puzzolana	[t/yr]	0	0	0	0	0	0
Others - kiln filter dust	[t/yr]	20,424	16,607	13,363	11,109	7,507	7,210
Total MIC consumed for blending	[t/yr]	222,177	193,832	156,174	114,889	134,788	126,750
<b>Production totals:</b>							
Total cement	[t/yr]	708,907	637,742	558,994	463,565	485,042	434,464
Total cementitious products	[t/yr]	719,659	669,398	563,106	464,892	539,736	537,263
<b>Direct CO2 Emissions</b>							
<b>CO2 from Raw Materials</b>		2007	2008	2009	2010	2011	2012
Calcination emission factor, corrected for CaO- and MgO imports	[kg CO2/ t cli]	511	511	504	512	487	477
Raw meal consumption	[t/yr, dry weight]	783,536	749,016	640,918	551,255	637,793	646,558
CO2 from calcination of clinker	[t CO2/yr]	254,035	242,844	205,114	179,276	197,091	195,676
CO2 from CKD not recycled (separate for cement mill, discarded, lost)	[t CO2/yr]	5,081	4,857	4,102	3,586	3,942	3,914
Total CO2 from raw materials	[t CO2/yr]	259,116	247,701	209,216	182,861	201,033	199,590





# Preparation of subsectoral spreadsheets (2)

## Plant-specific data

Total clinker production and composition		2007	2008	2009	2010	2011	2012
Clinker produced	[t/yr]	497,482	475,566	406,932	350,003	404,948	410,513
CaO content (incl. free lime)	[%]	65.1	65.1	64.2	65.3	62.0	60.7
MgO content	[%]	1.9	1.7	0.6	1.8	0.7	0.9
CaO amount	[t/yr]	323,712	309,451	261,372	228,447	251,149	249,346
MgO amount	[t/yr]	9,303	7,942	2,482	6,195	2,916	3,859
Correction for non-carbonate sources of CaO, MgO found in clinker							
Total of raw materials		2007	2008	2009	2010	2011	2012
Raw material consumed	[t/yr]	783,536	749,016	640,918	551,255	637,793	646,558
CaO content	[%]	42.8	42.9	42.7	42.8	40.5	38.6
MgO content	[%]	1.1	1.1	0.4	1.2	0.5	0.6
CaO amount	[t/yr]	335,197	321,627	273,928	236,047	258,051	249,377
MgO amount	[t/yr]	8,776	8,014	2,820	6,395	3,125	3,879
CO2 emissions from raw material calcination							
Absolute CO2 emissions		2007	2008	2009	2010	2011	2012
Uncorrected CO2 emissions, based on CaO- and MgO content of clinker	[t CO2/yr]	264,048	251,378	207,708	185,938	200,163	199,778
Correction for imports of CaO and MgO via raw materials etc.	[t CO2/yr]	272,481	261,007	217,925	192,117	205,805	199,826
Corrected, direct CO2 emissions	[t CO2/yr]	-8,432	-9,630	-10,217	-6,179	-5,642	-47
Specific CO2 emissions per ton of clinker		2007	2008	2009	2010	2011	2012
Calcination factor, uncorrected	[kg CO2/t cli]	531	529	510	531	494	487
Calcination factor, corrected for CaO- and MgO imports (= input into CO2 inventory, line 35)	[kg CO2/t cli]	-17	-20	-25	-18	-14	0
	Calcination EF	511	511	504	512	487	477

spreadsheets “CO2 emission” and “Calcination CO2” are linked




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# Preparation of sectoral spreadsheets (1)

Aggregate plant-specific data - national level

	PORTLAND	ALUMINATE	CRF activity data
	clinker production (t)	clinker production (t)	clinker production (kt)
2007	3,046,209	114,311	3,160.520
2008	2,883,266	111,787	2,995.053
2009	2,355,148	83,911	2,439.059
2010	2,229,152	91,332	2,320.484
2011	1,965,307	106,353	2,071.660
2012	1,896,912	99,587	1,996.499
	PORTLAND	ALUMINATE	
	actual clinker prod.	actual clinker prod.	actual clinker prod.
	(*CKD) (kt)	(*CKD) (kt)	(kt)
2007	3,107.133	116.597	3,223.730
2008	2,940.931	114.023	3,054.954
2009	2,402.251	85.589	2,487.840
2010	2,273.735	93.159	2,366.894
2011	2,004.613	108.480	2,113.093
2012	1,934.850	101.579	2,036.429


**Cement P**
Lime P
Lime&Dol U
Soda Ash P&U
Mineral Prod P&U



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# Preparation of sectoral spreadsheets (2)

Aggregate plant-specific data - national level

	EF (kg CO <sub>2</sub> /t clt) - PORTLAND				EF (kg CO <sub>2</sub> /t clt) - ALUMINATE
	Plant A	Plant B	Plant C	AVERAGE	Plant D
2007	493	518	511	507	310
2008	493	518	511	507	311
2009	513	480	504	499	310
2010	509	522	512	515	309
2011	520	517	487	508	306
2012	514	512	477	501	301
	PORTLAND CO <sub>2</sub> (Gg)	ALUMINATE CO <sub>2</sub> (Gg)	CRF emission CO <sub>2</sub> emission (Gg)	CRF emission SO <sub>2</sub> emission (Gg)	
2007	1576.395	35.485	1611.880	1.299	<div>ahublin: emissions were taken from Collector (CLRTAP)</div>
2008	1492.073	34.794	1526.867	1.626	
2009	1198.057	26.117	1224.174	1.424	
2010	1169.927	28.333	1198.260	1.031	
2011	1017.688	32.673	1050.361	0.831	
2012	968.910	29.961	998.871	0.782	

cells in the  
spreadsheets  
are linked

Cement P   Lime P   Lime&Dol U   Soda Ash P&U   Mineral Prod P&U   Ammonia P   Nitric Acid P   Other Chemical P   Iron&St

Tier 2 method is used for CO<sub>2</sub> emission calculation (2006 IPCC GLs)



# Preparation of “meta CRF table”

Exported table from CRF Reporter Inventory Software

[2. Industrial Processes and Product Use][2.A Mineral Industry][2.A.1 Cement Production]								
[2. Industrial Processes and Product Use]	Unit	2007	2008	2009	2010	2011	2012	2013
Activity data								
(specify - cement or clinker production )	kt	3,160.520	2,995.053	2,439.059	2,320.484	2,071.660	1,996.499	
Method								
CO2								
Emission factor information								
CO2								
Emissions								
CO2	kt	1,611.880	1,526.867	1,224.174	1,198.260	1,050.361	998.871	
SO2	kt	1.299	1.626	1.424	1.031	0.831	0.782	
Recovery								
CO2	kt	NO	NO	NO	NO	NO	NO	
Implied emission factor								
CO2	t/t							
Documentation box								

cells in “meta CRF table” are linked with sectoral spreadsheets

# CRF Reporter Inventory Software (1)



**United Nations**  
Framework Convention on  
Climate Change

ser Preferences Settings ▾ Submission Management ▾ **Data Entry** Key Categories List Reporting Tables Data Export / Import Quality Assurance Control ▾

ctors/Totals : 2. Industrial Processes and Product Use : 2.A Mineral Industry : 2.A.1 Cement Production

**Navigation Tree**

- Sectors/Totals
  - 1. Energy
  - 2. Industrial Processes and Product Use
    - 2.A Mineral Industry
      - 2.A.1 Cement Production**
      - 2.A.2 Lime Production
      - 2.A.3 Glass production
      - 2.A.4 Other Process Uses of Carbonates
    - 2.B Chemical Industry
    - 2.C Metal Industry
    - 2.D Non-energy Products from Fuels and Solvent Use

**Table**

Id	[2. Industrial Processes and Product Use] 2.A Mineral Industry [2.A.1 Cement Production]	Unit	2007	2008	2009	2010	2011	2012	2013
L1	Activity data								
L2	Method	kt							
L3	CO2								
L4	Emission factor information								
L5	CO2								
L6	Emissions								
L7	CO2	kt							
L8	SO2	kt							
L9	Recovery								
L10	CO2	kt							
L11	Implied emission factor								
L12	CO2	kt							
L13	Documentation box								
L14									

**Comments**

comment party comment user comment

specify - cement or clinker production

imported data from "meta CRF table"

IEF is calculated by software

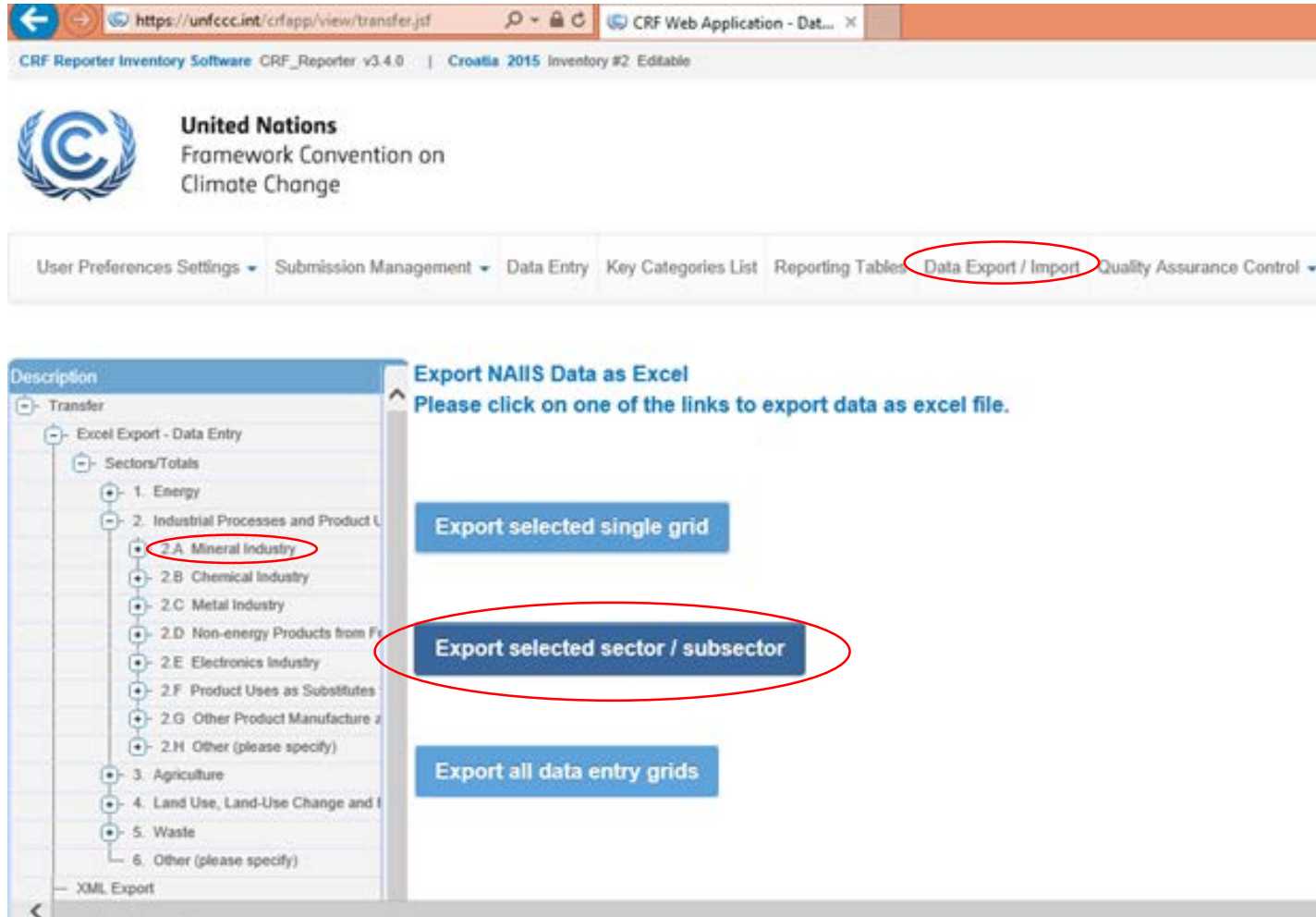
enter method

enter EF information



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# CRF Reporter Inventory Software (2)



The screenshot shows the CRF Reporter Inventory Software interface. The browser address bar displays <https://unfccc.int/crfapp/view/transfer.jsf>. The page title is "CRF Reporter Inventory Software | Croatia 2015 Inventory #2 Editable".

The United Nations Framework Convention on Climate Change logo is visible. Below it, a navigation bar contains the following items: User Preferences Settings, Submission Management, Data Entry, Key Categories List, Reporting Tables, **Data Export / Import** (circled in red), and Quality Assurance Control.

The main content area is titled "Export NAIIS Data as Excel" and includes the instruction: "Please click on one of the links to export data as excel file." Below this instruction are three buttons: "Export selected single grid", **Export selected sector / subsector** (circled in red), and "Export all data entry grids".

On the left side, a tree view under "Description" shows the following structure:

- Transfer
  - Excel Export - Data Entry
    - Sectors/Totals
      - 1. Energy
      - 2. Industrial Processes and Product Use
        - 2.A Mineral Industry** (circled in red)
        - 2.B Chemical Industry
        - 2.C Metal Industry
        - 2.D Non-energy Products from Fuels
        - 2.E Electronics Industry
        - 2.F Product Uses as Substitutes
        - 2.G Other Product Manufacture
        - 2.H Other (please specify)
      - 3. Agriculture
      - 4. Land Use, Land-Use Change and Forestry
      - 5. Waste
      - 6. Other (please specify)

At the bottom of the tree view, there is an option for "XML Export".



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# CRF Reporter Inventory Software (3)

CRF Reporter Inventory Software: CRF\_Reporter v3.4.0 | Croatia 2015 Inventory #2 Editable

United Nations  
Framework Convention on  
Climate Change

User Preferences Settings ▾ Submission Management ▾ Data Entry Key Categories List Reporting Tables **Data Export / Import** Quality Assurance Control ▾

**Import CRF\_Reporter Data**  
Please select CRF\_Reporter Data file

Excel / XML - Import

Browse...

Submit Query

“meta CRF table”



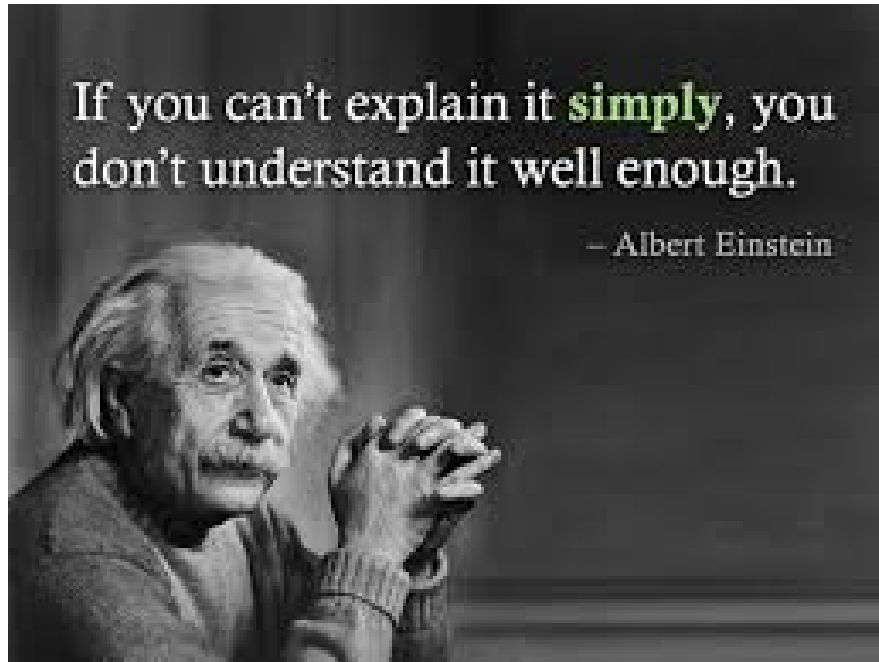
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If you can't explain it **simply**, you  
don't understand it well enough.

– Albert Einstein



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# Contact & Information

Andrea Hublin

EKONERG - Energy and Environmental Protection Institute

Phone +385 1 6000 134

[andrea.hublin@ekonerg.hr](mailto:andrea.hublin@ekonerg.hr)

[www.ekonerg.hr](http://www.ekonerg.hr)



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Consortium