



INTERNATIONAL ATOMIC ENERGY AGENCY



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IAEA-CPS-93/18
4 November 1993
Original: ENGLISH

COUNTRY PROGRAMME SUMMARY

**THE AGENCY'S TECHNICAL CO-OPERATION
PROGRAMME WITH
ROMANIA
1983 - 1993
COUNTRY PROGRAMME SUMMARIES**

DEPARTMENT OF TECHNICAL CO-OPERATION

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EVALUATION SECTION

DEPARTMENT OF TECHNICAL CO-OPERATION

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ROMANIA
1983 - 1993
COUNTRY PROGRAMME SUMMARIES**

This report contains a review of the Agency's technical co-operation activities in Romania carried out during 1983 - 1993. In terms of coverage and analytical depth, country programme summaries stand somewhere midway between in-depth country programme evaluations and individual project evaluations. They attempt to provide a comprehensive, descriptive picture of the Agency's co-operation with a Member State in a manner that will be particularly useful for programming decisions. The attempt is very much to describe -- largely through statistical data -- not to provide independent analysis and evaluation.

ROMANIA

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INTRODUCTION

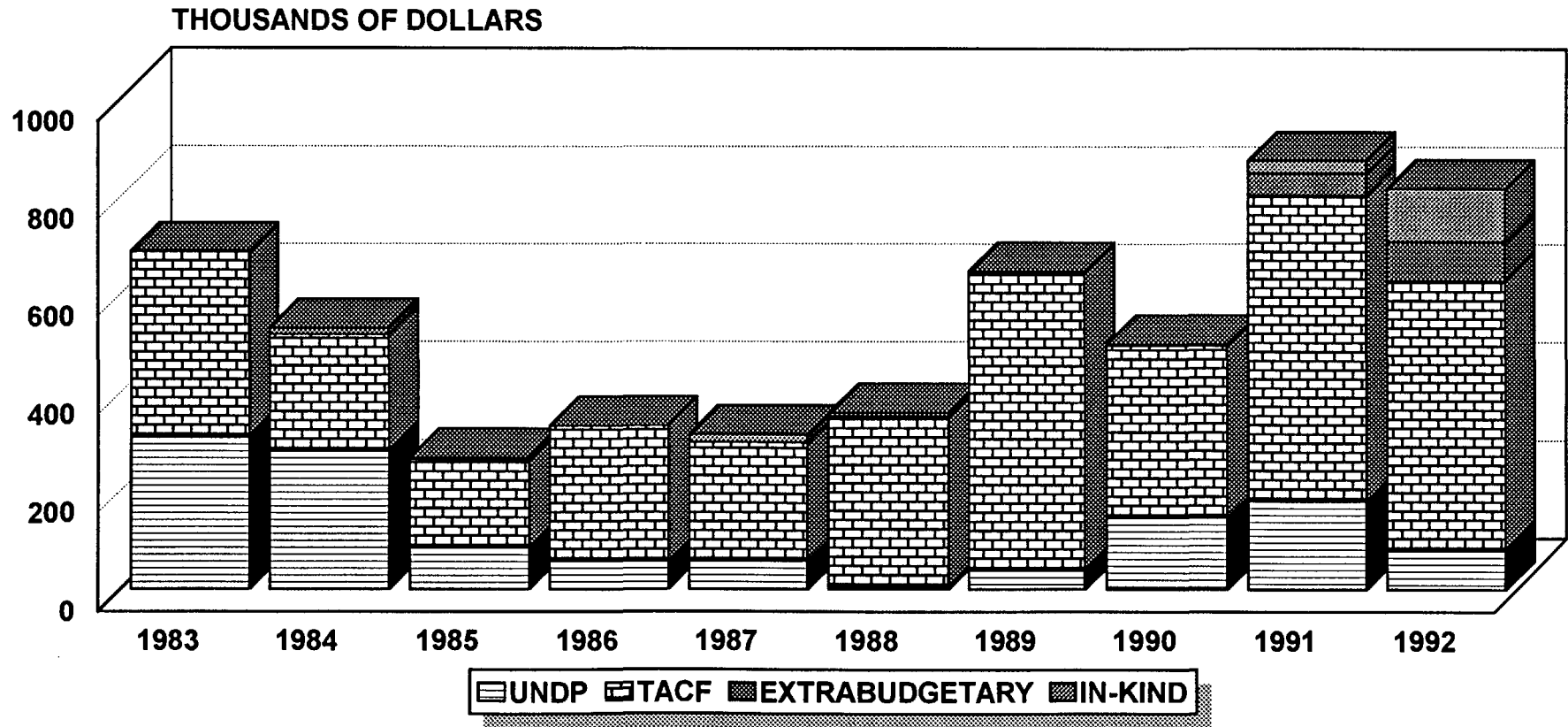
The country programme summary reported on here is one in the series of such studies being undertaken of the Agency's TC programme with Member States. With \$9.2 million of Agency support received, Romania ranks 18th among all recipients of technical assistance during the period 1958 through 1992.

Well over half of the assistance received during the past ten years has been provided in the form of equipment (68%), complemented by expert services (18%) and training (14%). Seventy-one per cent of the resources were made available through the TACF, a significant share was provided by UNDP (23%), and extrabudgetary contributions and in-kind assistance each accounted for 3% of total resources.

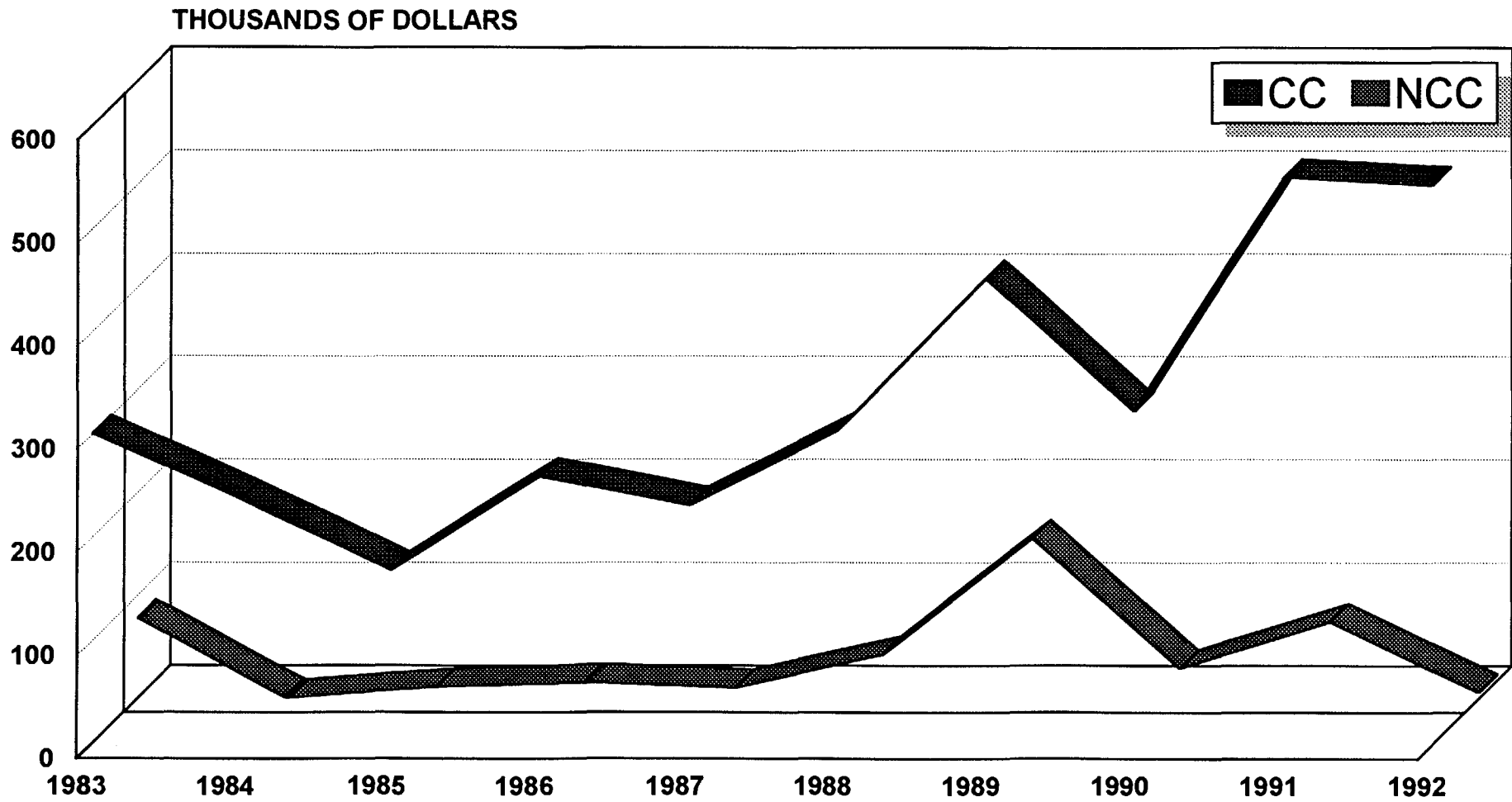
As regards total disbursements, by sector, under all projects that were operational during the period 1983 through mid-October 1993, the three major areas have been nuclear physics and chemistry (36%), nuclear safety (30%) and nuclear engineering and technology (21%).

During the same period, Romania has provided experts and training course lecturers for a total of 78 assignments, and has hosted one fellowship and four scientific visits.

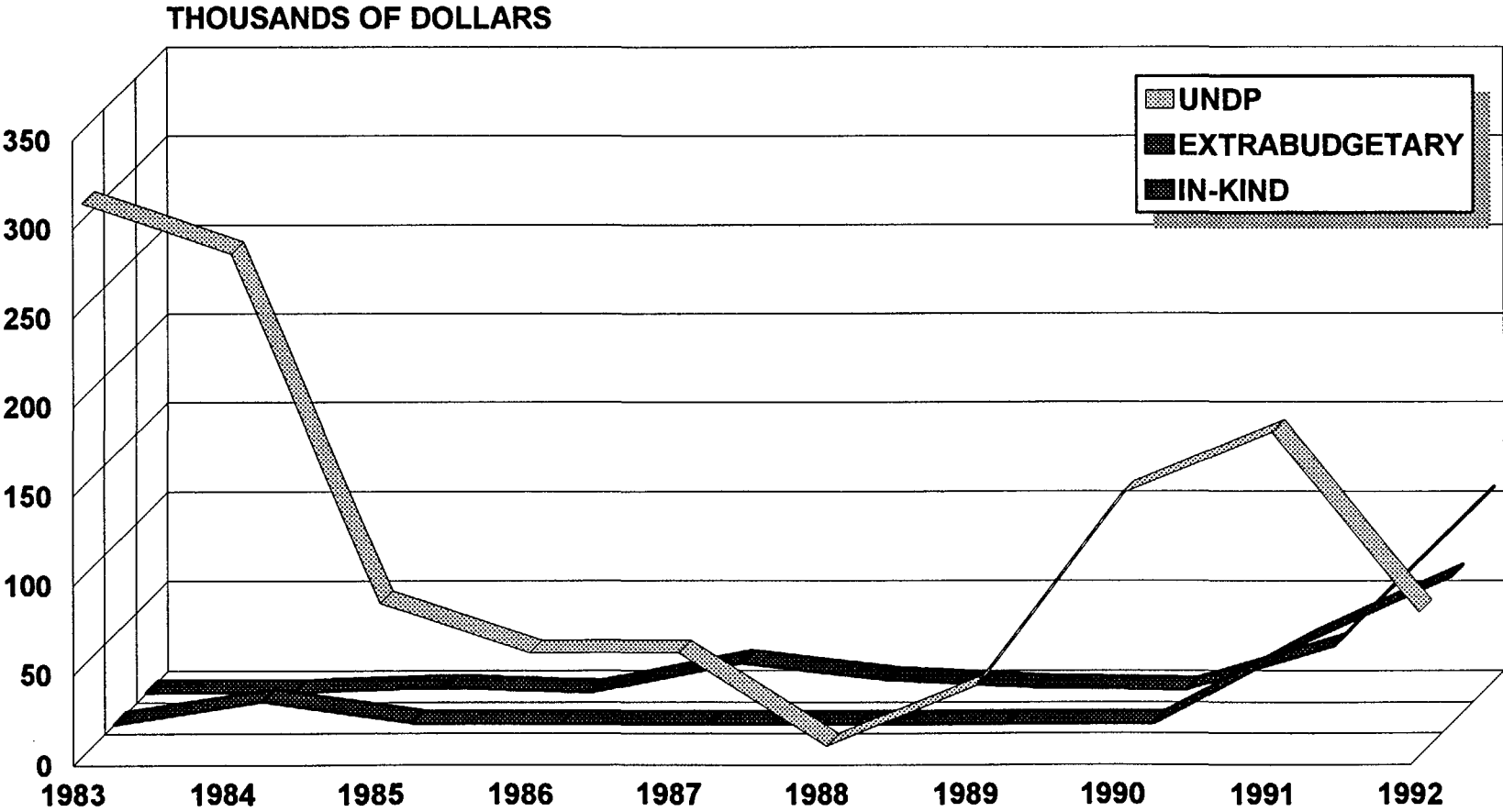
ASSISTANCE PROVIDED BY THE AGENCY TO ROMANIA BY SOURCE (1983 - 1992)



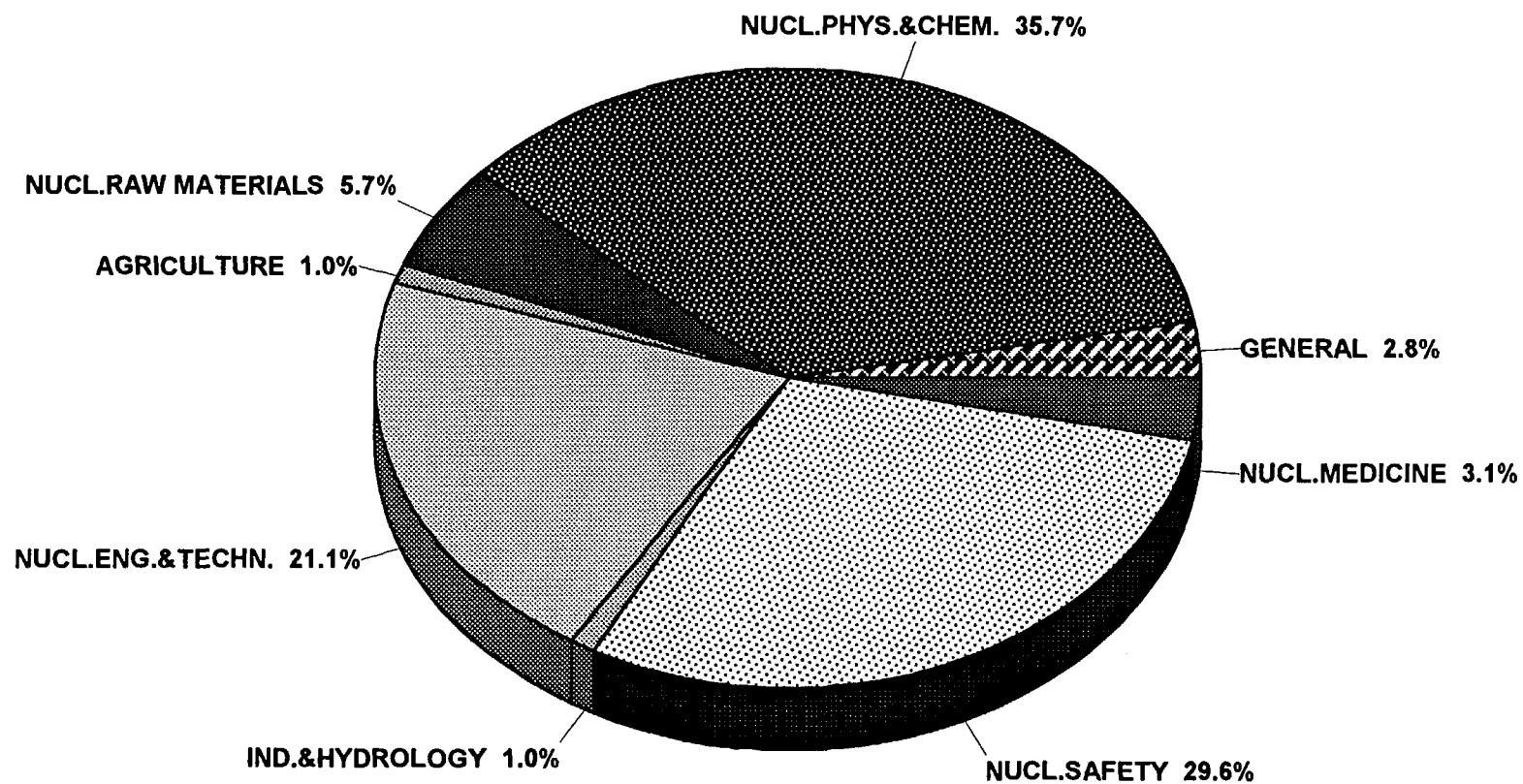
TACF ASSISTANCE PROVIDED TO ROMANIA (1983 - 1992) BY CC AND NCC



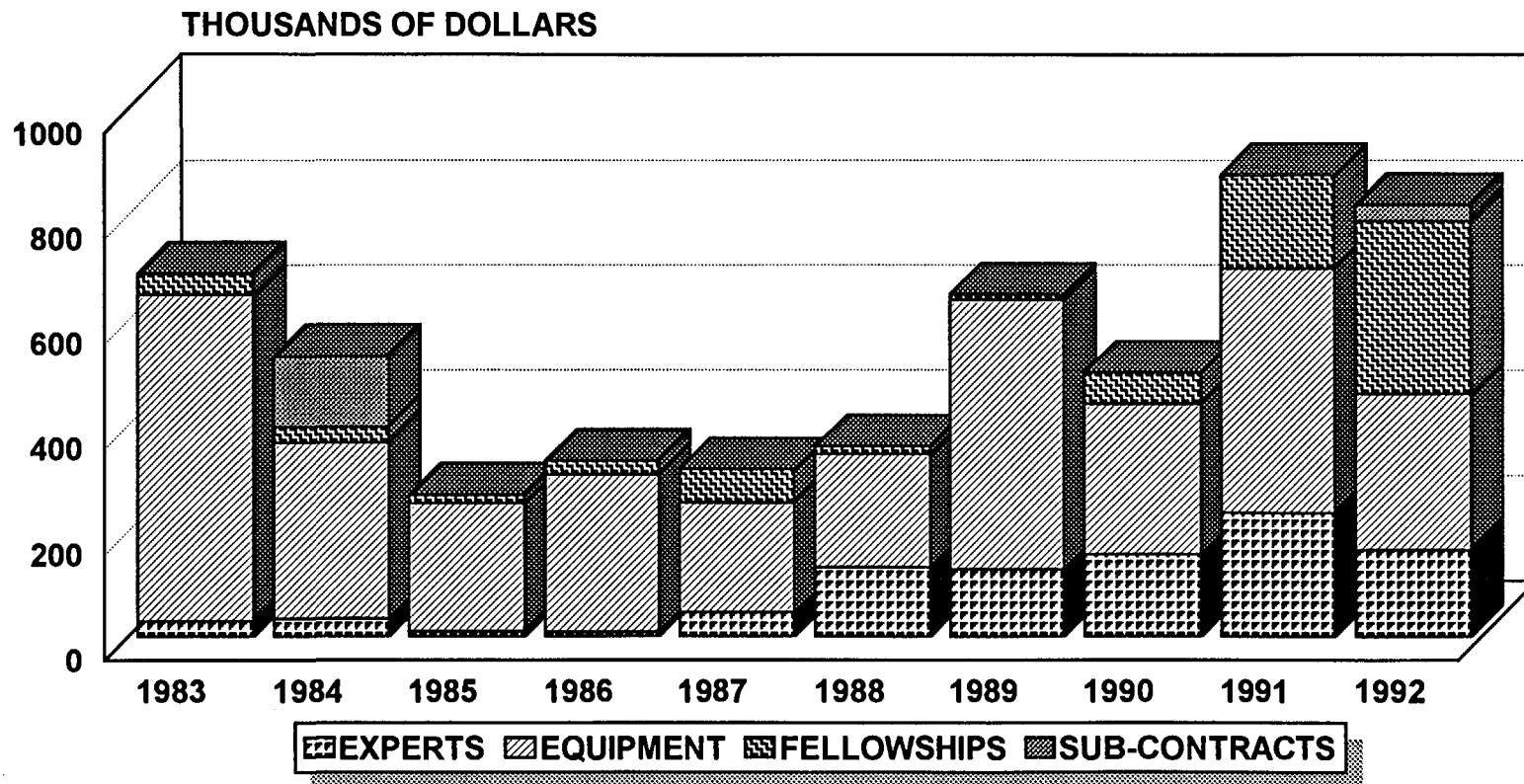
UNDP, EXTRABUDGETARY AND IN - KIND ASSISTANCE PROVIDED TO ROMANIA (1983 - 1992)



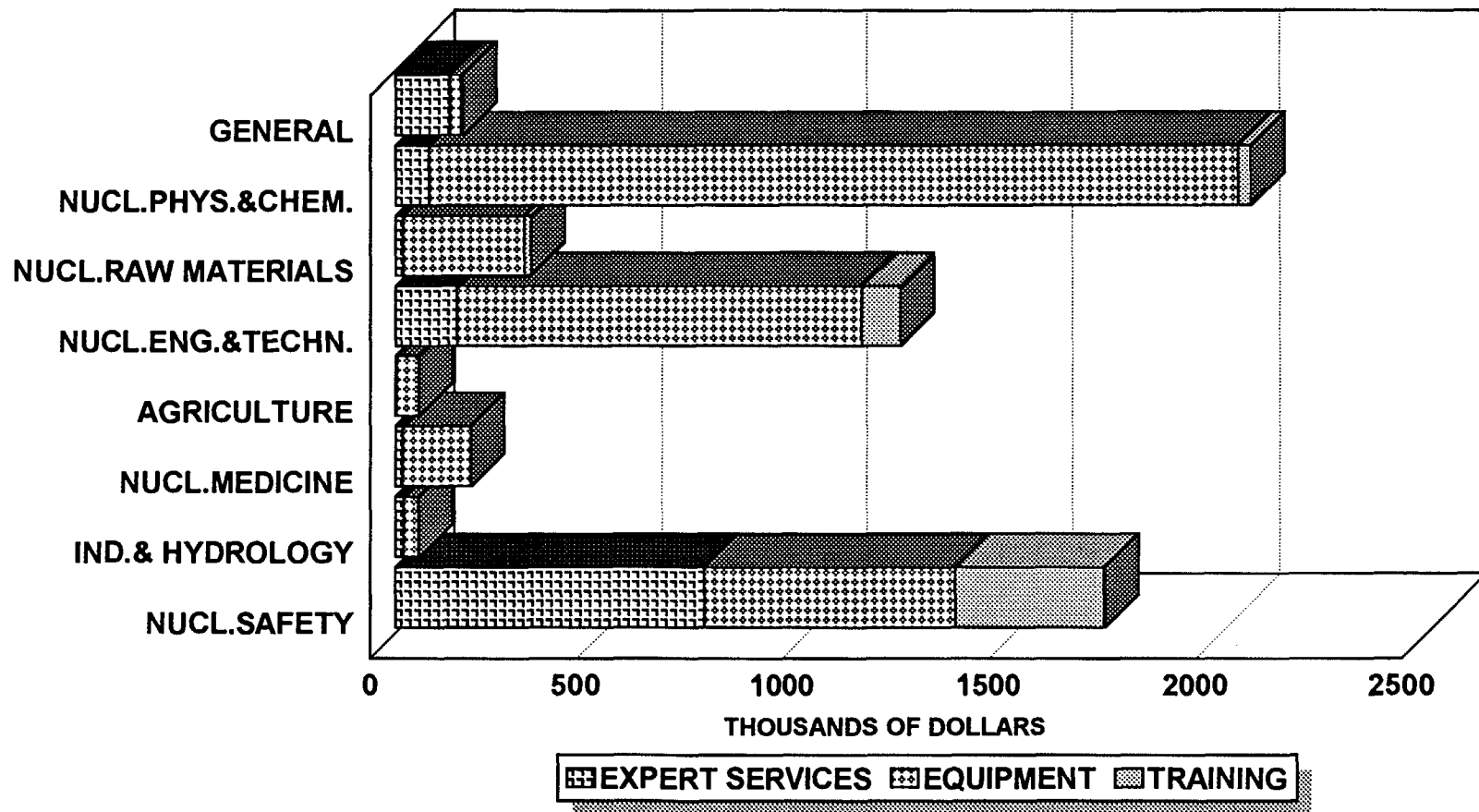
TC PROJECT DISBURSEMENTS IN ROMANIA BY SECTOR (1983 - 1993)



ASSISTANCE PROVIDED BY THE AGENCY TO ROMANIA BY TYPE (1983 - 1992)



EXPERT SERVICES, EQUIPMENT AND PROJECT-FUNDED TRAINING PROVIDED TO ROMANIA BY SECTOR (1983 - 1993)



THE AGENCY'S TECHNICAL CO-OPERATION PROGRAMME WITH ROMANIA

ALL SOURCES

ROMANIA'S RANKING AS A TC RECIPIENT
1958 - 1992
(in \$1000)

YEAR	RANKING	AMOUNT
1958-82	14 th	3827.9
1983	8 th	688.1
1984	13 th	531.3
1985	31 st	267.2
1986	36 th	332.0
1987	38 th	315.0
1988	28 th	358.9
1989	14 th	647.9
1990	29 th	498.8
1991	8 th	875.8
1992	13 th	818.6
1958-92	18 th	9161.5

**"TOP FIVE" RECIPIENTS OF AGENCY ASSISTANCE
1958 - 1992 (in \$1000)**

ALL SOURCES

Year	I	II	III	IV	V	ROMANIA
1958-82	BRA 8507.3	IND 6849.4	ARG 5528.2	PAK 5492.7	CHI 5240.1	14 th - 3827.9
1983	EGY 2077.9	PER 1116.8	VIE 948.1	PHI 778.6	IRA 722.1	8 th - 688.1
1984	EGY 3625.9	PER 1750.4	THA 1094.6	CUB 1028.7	PHI 881.2	13 th - 531.3
1985	EGY 2494.8	PER 1120.7	THA 1117.4	BGD 1068.2	PHI 963.7	31 st - 267.2
1986	EGY 2317.0	BRA 1452.9	THA 1169.4	POL 1050.3	BGD 896.4	36 th - 332.0
1987	HUN 3452.6	EGY 1775.4	THA 1742.4	INS 1312.5	YUG 1223.2	38 th - 315.0
1988	EGY 1486.9	BUL 1361.6	CPR 1278.5	THA 1158.7	BRA 1096.7	28 th - 358.9
1989	CPR 1542.3	EGY 1505.1	THA 1205.3	BRA 1096.5	INS 999.1	14 th - 647.9
1990	POL 2308.1	CPR 2005.0	VIE 1589.2	INS 1412.6	BRA 1229.1	29 th - 498.8
1991	INS 1305.2	CPR 975.0	EGY 959.8	BRA 951.2	BUL 934.7	8 th - 875.8
1992	EGY 1586.3	INS 1342.1	CPR 1328.8	MEX 1127.8	POL 1036.4	13 th - 818.6
1958-92	EGY 23808.6	BRA 17736.8	THA 15332.0	INS 13725.9	PER 13129.6	18 th - 9161.5

**"TOP FIVE" RECIPIENTS OF AGENCY ASSISTANCE
1958 - 1992 (in \$1000)**

TECHNICAL ASSISTANCE AND CO-OPERATION FUND

Year	I	II	III	IV	V	ROMANIA
1958-82	HUN 2971.7	EGY 2405.8	PAK 2340.5	THA 2000.3	BRA 1983.5	12 th - 1593.8
1983	EGY 1049.4	VIE 897.4	POL 667.8	PAK 498.5	PHI 430.0	8 th - 378.7
1984	EGY 1197.2	CUB 655.6	ECU 565.6	BGD 506.3	BUL 472.4	24 th - 238.1
1985	BGD 991.8	VIE 745.0	THA 708.7	BRA 571.8	POR 538.7	38 th - 179.4
1986	BRA 1381.8	THA 871.9	POL 833.5	BGD 823.9	SYR 751.8	33 rd - 274.8
1987	HUN 3305.2	DRK 986.8	BUL 888.5	INS 885.8	EGY 878.9	43 rd - 241.5
1988	BUL 1195.6	PER 856.5	EGY 768.6	INS 751.7	MAL 656.0	20 th - 346.4
1989	EGY 990.9	CPR 868.2	POR 769.6	CHI 756.9	MAL 619.4	6 th - 606.7
1990	POL 1562.3	VIE 1518.8	DRK 1156.2	IRA 958.0	YUG 933.4	30 th - 351.6
1991	BUL 893.1	PAK 868.8	INS 855.1	VIE 817.6	CPR 814.5	9 th - 624.6
1992	EGY 1255.7	CPR 1009.0	VIE 872.8	INS 826.6	IRA 795.5	21 st - 548.9
1958-92	EGY 10847.0	HUN 8743.7	POL 8486.4	VIE 8199.9	PAK 8115.6	23 rd - 5384.5

ASSISTANCE PROVIDED BY THE AGENCY TO ROMANIA

Financial Summary 1983 - 1992
(In thousands of dollars)

Year	ASSISTANCE PROVIDED, BY TYPE						ASSISTANCE PROVIDED, BY SOURCE					
	Experts	Equipment	Fellowships	Group training	Sub-contracts	Total	UNDP	TACF CC	TACF NCC	Extra-budgetary	In-kind	Total
1983	29.4	619.3	39.4	-	-	688.1	309.4	301.3	77.4	-	-	688.1
1984	33.4	333.3	30.1	-	134.5	531.3	280.7	238.1	-	12.5	-	531.3
1985	10.1	241.7	15.4	-	-	267.2	84.7	168.4	11.0	0.4	2.7	267.2
1986	8.0	298.3	25.7	-	-	332.0	57.2	259.6	15.2	-	-	332.0
1987	45.6	206.8	62.6	-	-	315.0	57.1	231.5	10.0	-	16.4	315.0
1988	129.9	214.7	14.3	-	-	358.9	5.5	304.2	42.2	-	7.0	358.9
1989	126.4	511.7	9.8	-	-	647.9	38.5	452.4	154.3	-	2.7	647.9
1990	154.6	284.9	59.3	-	-	498.8	145.8	322.6	29.0	-	1.4	498.8
1991	232.7	464.5	178.6	-	-	875.8	180.3	550.6	74.0	45.1	25.8	875.8
1992	163.3	295.7	329.6	-	30.0	818.6	79.9	542.8	6.1	81.8	108.0	818.6
1983-92	933.4	3 470.9	764.8	-	164.5	5 333.6	1 239.1	3 371.5	419.2	139.8	164.0	5 333.6

TECHNICAL CO-OPERATION PROJECTS IN ROMANIA
BY SECTOR

PROJECTS COMPLETED AND OPERATIONAL 1983 - 1993

TOTAL PROJECT ALLOTMENTS AND DISBURSEMENTS
(as of mid-October 1993)

SECTOR	NO. OF PROJECTS	ALLOTMENTS \$	% OF TOTAL	DISBURSEMENTS \$	% OF TOTAL
General atomic energy development	3	446 507	5.3	162 871	2.8
Nuclear physics and chemistry	7	2 101 514	25.1	2 073 470	35.7
Nuclear raw materials	1	337 105	4.0	329 853	5.7
Nuclear engineering and technology	8	1 511 885	18.1	1 224 563	21.1
Nuclear techniques in agriculture	2	130 527	1.6	58 783	1.0
Nuclear medicine	4	441 606	5.3	182 461	3.1
Nuclear techniques in biology	-	-	-	-	-
Nuclear techniques in industry and hydrology	4	1 010 550	12.1	58 260	1.0
Nuclear safety	14	2 387 079	28.5	1 719 622	29.6
TOTAL	43	8 366 773	100.0	5 809 883	100.0

TECHNICAL CO-OPERATION PROJECTS IN ROMANIA
 COMPLETED AND OPERATIONAL, BY SECTOR, 1983 - 1993
 (As of mid-October 1993)

Sector	No. of projects	Total project allotments \$	Total project disbursements \$
<u>Completed projects</u>			
General atomic energy development	-	-	-
Nuclear physics and chemistry	6	1 748 132	1 735 471
Nuclear raw materials	1	337 105	329 853
Nuclear engineering and technology	4	1 052 866	1 058 533
Nuclear techniques in agriculture	1	60 927	56 716
Nuclear medicine	2	50 856	26 594
Nuclear techniques in biology	-	-	-
Nuclear techniques in industry & hydrology	2	22 800	18 448
Nuclear safety	3	297 344	407 853
TOTAL	19	3 570 030	3 633 468
<u>Operational projects</u>			
General atomic energy development	3	446 507	162 871
Nuclear physics and chemistry	1	353 382	337 999
Nuclear raw materials	-	-	-
Nuclear engineering and technology	4	459 019	166 030
Nuclear techniques in agriculture	1	69 600	2 067
Nuclear medicine	2	390 750	155 867
Nuclear techniques in biology	-	-	-
Nuclear techniques in industry & hydrology	2	987 750	39 812
Nuclear safety	11	2 089 735	1 311 769
TOTAL	24	4 796 743	2 176 415

**EXPERT SERVICES, EQUIPMENT AND PROJECT-FUNDED TRAINING PROVIDED TO ROMANIA, BY SECTOR
PROJECTS COMPLETED AND OPERATIONAL 1983 - 1993
(As of mid-October 1993)**

FIELD	TOTAL PROJECT ALLOTMENTS				TOTAL PROJECT DISBURSEMENTS			
	EXPERT SERVICES		EQUIPMENT	TRAINING	EXPERT SERVICES		EQUIPMENT	TRAINING
	M/M	\$	\$	\$	M/M	\$	\$	\$
General atomic energy development	7/08	239 948	32 600	173 959	4/28	131 008	27 106	4 757
Nuclear physics and chemistry	13/16	90 432	1 977 616	33 466	13/18	82 024	1 961 013	30 433
Nuclear raw materials	2/17	24 625	297 930	14 550	3/01	17 923	297 380	14 550
Nuclear engineering and technology	22/19	271 920	1 109 202	130 763	13/08	148 713	983 472	92 378
Nuclear techniques in agriculture	2/19	25 077	87 000	18 450	0/19	1 767	54 949	2 067
Nuclear medicine	4/29	53 150	375 856	12 600	1/12	16 638	165 823	-
Nuclear techniques in biology	-	-	-	-	-	-	-	-
Nuclear techniques in industry & hydrology	9/25	105 975	860 925	43 650	1/19	20 037	35 809	2 414
Nuclear safety	95/04	794 892	1 067 683	524 504	73/22	747 061	610 881	361 680
TOTAL	158/17	1 606 019	5 808 812	951 942	112/07	1 165 171	4 136 433	508 279

AGENCY FELLOWS FROM ROMANIA
 1983 - 1993¹
 (As of mid-October 1993)

Sector	No. of fellowships	No. of months/days	Host countries
General atomic energy development	18	43/01	FRA, ITA, AUS, GER, RUS, SWE, SPA, CAN, IAEA
Nuclear physics	8	18/15	USA, AUS, GER, FRA, DEN
Nuclear chemistry	3	7/02	SWI, FRA, USA, UK
Nuclear raw materials	7	31/17	FRA, CAN, USA, UK
Nuclear engineering and technology	33	85/08	FIN, CAN, ARG, EGY, NET, USA, IND, IAEA
Nuclear techniques in agriculture	10	37/25	FRA, USA, BEL, AUL, NZE, JPN, CPR, GER, UK, IAEA
Nuclear medicine	7	6/15	SWE, AUS, AUL, DEN, FRA, GER, UK
Nuclear techniques in biology	-	-	-
Nuclear techniques in industry and hydrology	10	11/19	SWE, GER, ITA, POL, ISR, COL, FRA, IAEA
Nuclear safety	49	131/25	FRA, GER, SWI, YUG, CAN, CPR, HUN, ISR, USA, SWE, ROK, DEN, IAEA
TOTAL	145	373/07	

^{1/} Only includes fellows who have completed or at least started training.

ROMANIA
LONG-TERM FELLOWSHIPS
1983 - 1993
(As of mid-October 1993)

Name	Field of study	Host country	Date	Duration	Project
BENGULESCU	General atomic energy development	FRA IAEA AUS	Feb.91 - Feb.92	12/17	RER/0/005
PUTINEANU	Administration in nuclear fields	IAEA	Feb.91 - Feb.92	12/19	RER/0/005
COMAN	Safety evaluation	USA	Oct.91 - Dec.92	14/02	ROM/9/007
GALERIU	Radiation protection	CAN	Started: Aug.92	15/00	ROM/9/006
MOISEEV	Radiation protection	FRA	May 91 - May 92	12/01	ROM/4/013

ROMANIAN NATIONALS WHO WERE AWARDED MORE THAN ONE
FELLOWSHIP OR SCIENTIFIC VISIT
1983 - 1993
(As of mid-October 1993)

Name	Field of study	Host country	Date	Duration	Project
BENGULESCU	1. Power reactor simulators 2. General atomic energy development	FIN FRA IAEA AUS	Sep.83 Feb.91 - Feb.92	0/08 12/17	ROM/4/010 RER/0/005
DINA	1. Safety evaluation 2. Safety of reactors and nuclear materials	CPR ROK	Apr.89 Apr.92 - May 92	0/19 0/13	RER/0/003 ROM/9/008
DINESCU	1. Radiation protection 2. Surface-water hydrology	IAEA FRA COL	Feb.91 - Mar.91 Jan.93 - Feb.93	1/03 1/01	ROM/9/006 RER/0/005
FORTUNA	1. Administration in nuclear fields 2. Radiation protection	SWE SWE	Mar.93 Mar.93	0/18 0/18	ROM/9/003 ROM/9/008
GALERIU	1. Environmental protection 2. Radiation protection	CAN GER CAN	Aug.91 - Sep.91 Started: Aug.92	1/12 15/00	ROM/9/006 ROM/9/006
HERA	1. Plant nutrition 2. Soil science, irrigation and plant nutrition	AUL NZE JPN CPR IAEA	Aug.86 Aug.90 - Sep.90	0/19 1/00	ROM/5/004 RER/0/003
LUPEI, V.	1. Atomic physics 2. Physical chemistry	USA SWI	Aug.83 - Sep.83 Aug.84	1/04 0/06	ROM/1/005 ROM/1/005

ROMANIAN NATIONALS WHO WERE AWARDED MORE THAN ONE
FELLOWSHIP OR SCIENTIFIC VISIT
1983 - 1993
(As of mid-October 1993)

Name	Field of study	Host country	Date	Duration	Project
POP	1. Nuclear medicine	SWE	Oct.85	0/15	-
	2. Nuclear medicine	GER	Jan.87 - Feb.87	0/12	-
	3. Nuclear medicine	AUS UK AUL	Nov.89 - Dec.89	0/26	RER/0/003
POPESCU	1. Nitrogen fixation	FRA USA BEL	Apr.84 - May 84	0/21	ROM/5/004
	2. Soil science, irrigation and plant nutrition	UK NET IAEA	Sep.93 - Oct.93	0/28	ROM/5/006

AGENCY TRAINING COURSES WITH ROMANIAN PARTICIPATION

1983 - 1993
(As of mid-October 1993)

Field	Number of participants	Number of courses
General atomic energy development	21	8
Nuclear physics	6	6
Nuclear chemistry	1	1
Nuclear raw materials	2	2
Nuclear engineering and technology	45	25
Nuclear techniques in agriculture	10	10
Nuclear medicine	7	6
Nuclear techniques in biology	-	-
Nuclear techniques in industry & hydrology	9	6
Nuclear safety	53	35
TOTAL	154	99

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES
BY ROMANIAN NATIONALS
1983 - 1993
(As of mid-October 1993)**

Name	Course No.	Course title	Year	Location
FEKETE	INT/9/117 (001) RER/9/014 (001)	ITC on safe transport of radioactive materials RTC on waste management - A system approach	1991 1992	UK CZE
FURTUNA, C.	INT/4/091 (001) INT/9/129 (001)	ITC on NPP control and instrumentation ITC on planning, organization and implementation of radiation protection on a national level	1987 1992	GFR USA
GARLEA	INT/1/038 (001) INT/9/132 (001)	ITC on neutron physics and nuclear data measurements in research reactors ITC on operational safety assessment techniques	1987 1993	USSR SPA
IANCU	INT/4/077 (001) INT/4/106 (001)	ITC on quality assurance ITC on quality assurance in NPP operation	1985 1991	ARG SPA
POPA	INT/4/076 (001) INT/9/092 (001)	Interregional study tour on spent fuel management ITC on operational safety in NPPs	1986 1988	CZE FRA GFR SWE UK FRA
SERBAN	INT/9/073 (001) INT/9/087 (001)	ITC on safety in NPP operation ITC on probabilistic safety assessment (PSA) in safety decision - managerial perspectives	1987 1988	USA CAN UK
VALCEREANU	INT/0/052 (001) INT/4/083 (001)	ITC on integrated energy and electricity planning for nuclear power development with emphasis on ENPEP ITC on electricity demand forecasting in nuclear power planning	1991 1986	USA USA

PROJECTS COMPLETED IN ROMANIA SINCE 1983
(As of mid-October 1993)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS				COMPLETED
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING	
			M/M	\$	\$	\$	M/M	\$	\$	\$	
1978	ROM/1/003	Nuclear physics	6/01	21 117	269 400	-	6/01	26 580	267 845	-	1984
1982	ROM/1/005	Applied actinide research	1/21	9 180	601 400	7 300	1/21	10 946	601 308	6 616	1988
1984	ROM/1/007	Dosimetry instrumentation	1/16	11 040	653 321	7 436	1/10	10 148	637 488	5 730	1991
1984	ROM/1/008	X-ray fluorescence spectrometry	-	-	51 100	-	-	-	51 978	-	1988
1989	ROM/1/010	Physics of materials	0/03	840	65 422	7 245	0/07	1 013	65 422	7 067	1991
1981	ROM/2/007	Nuclear techniques in materials analysis	-	-	43 331	-	-	-	43 330	-	1988
1986	ROM/3/002	Nuclear techniques in mining	2/17	24 625	297 930	14 550	3/01	17 923	297 380	14 550	1992
1980	ROM/4/009	Nuclear materials research	-	-	136 800	-	-	-	134 761	-	1984

**PROJECTS COMPLETED IN ROMANIA SINCE 1983
(As of mid-October 1993)**

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS				COMPLETED
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING	
			M/M	\$	\$	\$	M/M	\$	\$	\$	
1982	ROM/4/010	Assistance for nuclear power stations	7/06	79 000	557 379	22 009	7/06	79 000	557 379	22 009	1988
1983	ROM/4/011	Provision of enriched uranium dioxide	-	-	70 000	-	-	-	65 789	-	1983
1986	ROM/4/012	Nuclear power	2/12	17 025	170 653	-	2/19	30 879	168 716	-	1989
1983	ROM/5/004	Soil fertility studies	0/19	3 927	57 000	-	0/19	1 767	54 949	-	1988
1983	ROM/6/007	Radioreceptor assay	-	-	38 000	-	-	-	13 738	-	1984
1983	ROM/6/008	Nuclear medicine	-	-	12 856	-	-	-	12 856	-	1985
1982	ROM/8/008	Radiation polymerization	-	-	16 200	-	-	-	16 142	-	1987
1984	ROM/8/010	Gamma irradiation facility	1/00	6 600	-	-	0/13	2 306	-	-	1985
1988	ROM/9/003	Nuclear safety	28/03	218 040	16 084	13 390	26/24	360 268	16 084	6 088	1991

^{1/} Totals for equipment include \$254 228 for a sub-contract.

PROJECTS COMPLETED IN ROMANIA SINCE 1983
(As of mid-October 1993)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS				COMPLETED
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING	
			M/M	\$	\$	\$	M/M	\$	\$	\$	
1990	ROM/9/005	Pre-OSART missions to Cernavoda NPP	5/16	16 800	-	-	5/16	14 649	-	-	1991
1991	ROM/9/009	OSART and follow-up OSART (Follow-up pre-OSART to Cernavoda)	3/16	31 720	-	1 310	1/11	9 649	-	1 115	1992
	TOTAL	19 projects	60/10	439 914	3 056 876	73 240	56/28	565 128	3 005 165	63 175	

OPERATIONAL PROJECTS IN ROMANIA
(As of mid-October 1993)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS			
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING
			M/M	\$	\$	\$	M/M	\$	\$	\$
1991	ROM/0/002	Energy demand forecasting and electricity expansion planning	7/08	73 700	32 600	-	4/28	41 008	27 106	-
1993	ROM/0/003	Manpower development	-	-	-	173 959	-	-	-	4 757
1993	ROM/0/004	Support of Cernavoda training centre ^{1/}	-	166 248	-	-	-	90 000	-	-
1985	ROM/1/009	Heavy ion physics	4/05	48 255	293 642	11 485	4/09	33 337	293 642	11 020
1991	ROM/4/013	Development of nuclear detectors	1/09	11 655	66 610	71 254	1/19	14 045	56 827	70 369
1993	ROM/4/015	Computer-aided design for Cernavoda NPP engineering ^{2/}	5/22	105 540	57 760	16 150	0/29	13 327	-	-
1993	ROM/4/017	Cernavoda NPP project management	5/00	53 700	25 000	21 350	0/25	11 462	-	-

^{1/} \$300 000 extrabudgetary offer by Spain for sub-contracted expert services; paid to date: \$166 248.

^{2/} \$101 600 extrabudgetary offer by Spain for sub-contracted expert services and software; paid to date: \$44 250.

OPERATIONAL PROJECTS IN ROMANIA
(As of mid-October 1993)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS			
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING
			M/M	\$	\$	\$	M/M	\$	\$	\$
1993	ROM/4/018	Development of high efficiency air filters for Cernavoda NPP	1/00	5 000	25 000	-	-	-	-	-
1993	ROM/5/006	Use of beneficial bacteria for increased crop production	2/00	21 150	30 000	18 450	-	-	-	2 067
1991	ROM/6/010	Radioimmunoassay standardization and quality control ^{3/}	2/29	32 000	155 000	-	1/12	16 638	116 547	-
1993	ROM/6/011	Upgrading radiotherapy facilities in Romania	2/00	21 150	170 000	12 600	-	-	22 682	-
1993	ROM/8/011	Multi-purpose irradiation facility	6/00	68 550	693 000	25 650	0/29	12 820	-	-
1993	ROM/8/013	Sediment dynamics investigation by nuclear techniques	2/25	30 825	151 725	18 000	0/07	4 911	19 667	2 414
1988	ROM/9/004	Nuclear safety	5/12	71 012	363 948	80 955	4/27	62 724	348 579	50 054

^{3/} 1994 approval awaiting donors.

OPERATIONAL PROJECTS IN ROMANIA
(As of mid-October 1993)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS			
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING
			M/M	\$	\$	\$	M/M	\$	\$	\$
1991	ROM/9/006	Laboratory for environmental radioactivity monitoring	1/03	10 005	117 198	49 112	1/03	8 373	115 919	48 186
1991	ROM/9/007	Licensing of Cernavoda nuclear power plant ^{4/}	11/20	119 835	25 300	173 508	6/04	61 347	-	106 600
1991	ROM/9/008	Nuclear safety (phase II)	16/01	147 995	117 753	125 694	16/01	178 108	116 906	119 275
1991	ROM/9/010	Environmental radiation monitoring	2/07	20 095	-	30 885	1/17	17 039	-	30 362
1993	ROM/9/011	Improving radiation safety practices in Romanian hospitals	2/00	21 150	150 000	3 000	-	-	-	-
1993	ROM/9/012	Upgrading of environmental radioactivity surveillance laboratory	3/00	34 200	115 000	9 900	-	-	-	-
1993	ROM/9/013	Radiation protection management programme for tritium	2/07	24 615	99 400	9 300	0/07	1 990	7 110	-
1993	ROM/9/014	Review of radioactive waste management at Cernavoda NPP	2/00	21 150	38 000	18 450	0/23	6 471	-	-

^{4/} Allotment for experts includes \$5000 for a sub-contract.

OPERATIONAL PROJECTS IN ROMANIA
(As of mid-October 1993)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS			
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING
			M/M	\$	\$	\$	M/M	\$	\$	\$
1993	ROM/9/015	Developing a national emergency plan for nuclear accidents	1/15	15 975	25 000	9 000	0/15	6 388	6 283	-
1993	ROM/9/016	Nuclear safety review missions	10/24	42 300	-	-	8/24	20 055	-	-
	TOTAL	24 projects	98/07	1 166 105	2 751 936	878 702	55/09	600 043	1 131 268	445 104

Footnote-a/ projects not yet upgraded:

ROM/4/016 Study of slightly enriched uranium fuel for Cernavoda NPP
ROM/8/012 Recovery of groundwater dating activity by H-3 and C-14

COUNTERPART INSTITUTIONS IN ROMANIA (I)

(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>GENERAL ATOMIC ENERGY DEVELOPMENT</u>		
ROM/0/002	1. Institute for Power Studies and Design (ISPE), Bucharest	POPESCU POPOVICI
	2. Romanian Electricity Authority (RENEL), NPP Division, Bucharest	BILEGAN CHIRICA
ROM/0/003	Institute of Atomic Physics, Bucharest	PASCOVICI
ROM/0/004	1. Romanian Electricity Authority (RENEL), NPP Division, Bucharest	BILEGAN
	2. Institute for Nuclear Research, Pitesti	TURCU
	3. Filiala Centrale Nuclear Electrika Cernavoda, Cernavoda	MARCULESCU SERBAN
<u>NUCLEAR PHYSICS AND CHEMISTRY</u>		
ROM/1/003	Institute of Atomic Physics, Bucharest	CEAUSESCU BUCURESCU
ROM/1/005	Institute for Physics and Technology of Radiation Devices, Bucharest	URSU
ROM/1/007	Institute of Physics and Nuclear Engineering, Bucharest	PASCOVICI POPESCU
ROM/1/008	Institute of Research, Technological Engineering and Planning for Non-Ferrous Minerals and Metallurgy, Baia Mare	BARBUS PARASCHIV
ROM/1/009	Institute of Physics and Nuclear Engineering, Bucharest	PASCOVICI
ROM/1/010	Institute of Physics and Nuclear Engineering, Bucharest	IVANOV POPESCU
ROM/2/007	Institute for Physics and Technology of Materials, Bucharest	DANILA

COUNTERPART INSTITUTIONS IN ROMANIA (I)

(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>NUCLEAR RAW MATERIALS</u>		
ROM/3/002	Institute of Physics and Nuclear Engineering, Bucharest	BERINDE DORCIOMAN
<u>NUCLEAR ENGINEERING AND TECHNOLOGY</u>		
ROM/4/009	Metallurgical Research Institute, Bucharest	DRAGAN
ROM/4/010	Institute for Nuclear Research, Pitesti	ANDREESCU GLODEANU
ROM/4/011	Institute for Nuclear Research, Pitesti	ANDREESCU
ROM/4/012	Institute for Nuclear Research, Pitesti	-
ROM/4/013	Institute of Physics and Nuclear Engineering, Bucharest	NICOLESCU CONSTANTINESCU
ROM/4/015	Institute for Power Studies and Design (ISPE), Department of Nuclear Programmes, Bucharest	PANAIT ANDREESCU
ROM/4/017	1. Romanian Electricity Authority (RENEL), NPP Division, Bucharest 2. Institute for Nuclear Research, Pitesti 3. Filiala Centrale Nuclear Electrika Cernavoda, Cernavoda	BILEGAN TURCU MARCULESCU SERBAN
ROM/4/018	1. National Institute of Glass, Bucharest 2. Institute of Atomic Physics, Bucharest 3. Romanian Electricity Authority (RENEL), NPP Division, Bucharest	BARNA PASCOVICI BILEGAN

COUNTERPART INSTITUTIONS IN ROMANIA (I)

(By Project)

Project No. Institute Counterpart(s)

AGRICULTURE

ROM/5/004	Academy of Agricultural and Forestry Sciences, Research Institute for Cereals and Industrial Crops, Fundulea	HERA
ROM/5/006	Research Institute for Plant Protection, Department of Biochemistry and Bacteriology, Bucharest	SEVERIN ZURINI

NUCLEAR MEDICINE

ROM/6/007	Institute of Endocrinology "C.I.Parhon", Department of Nuclear Medicine, Bucharest	SIMIONESCU
ROM/6/008	Institute of Oncology, Bucharest	MURESAN
ROM/6/010	Institute of Endocrinology "C.I.Parhon", Department of Nuclear Medicine, Bucharest	SIMIONESCU DIMITRIU
ROM/6/011	1. Coltea Hospital, Clinic of Radiology-Oncology, Bucharest	PANA
	2. Institute of Oncology, Bucharest	PANA
	3. Oncological Institute, Cluj	BOLOGA

NUCLEAR TECHNIQUES IN INDUSTRY AND HYDROLOGY

ROM/8/008	Central Institute for Chemical Research, Bucharest	VASILESCU
ROM/8/010	Central Institute for Chemical Research, Bucharest	-

COUNTERPART INSTITUTIONS IN ROMANIA (I)

(By Project)

Project No. Institute Counterpart(s)

NUCLEAR TECHNIQUES IN INDUSTRY AND HYDROLOGY (cont'd)

ROM/8/011	1.	Institute of Atomic Physics, Bucharest	PONTA SANDRU
	2.	Institute for Nuclear Research, Pitesti	TOMA CIOCANESCU
	3.	Institute of Chemical and Pharmaceutical Research, Bucharest	ADRIAN DUMITRESCU
ROM/8/013	Institute of Physics and Nuclear Engineering, Bucharest		BERINDE DORCIOMAN

NUCLEAR SAFETY

ROM/9/003	1.	Institute for Nuclear Research, Pitesti	BILEGAN TURCU
	2.	National Commission for the Nuclear Activities Control, Bucharest	OLARIU
ROM/9/004	Institute for Nuclear Research, Pitesti		ALECU BILEGAN
ROM/9/005	1.	Romanian Electricity Authority (RENEL), NPP Division, Bucharest	BILEGAN
	2.	Filiala Centrale Nuclear Electrika Cernavoda, Cernavoda	POPA
	3.	Institute for Nuclear Power Reactors, Bucharest	ALECU
ROM/9/006	Institute of Physics and Nuclear Engineering, Bucharest		MATEESCU GALERIU
ROM/9/007	National Commission for the Nuclear Activities Control, Bucharest		NICORESTIANU BIRO

COUNTERPART INSTITUTIONS IN ROMANIA (I)

(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>NUCLEAR SAFETY</u> (cont'd)		
ROM/9/008	1. Romanian Electricity Authority (RENEL), NPP Division, Bucharest	BILEGAN
	2. Institute for Nuclear Research, Pitesti	TURCU
	3. Filiala Centrale Nuclear Electrika Cernavoda, Cernavoda	MARCULESCU SERBAN
ROM/9/009	Romanian Electricity Authority (RENEL), NPP Division, Bucharest	BILEGAN
ROM/9/010	Ministry of Environment, Department of Environment, Institute of Environmental Research and Engineering, Environmental Radioactivity Laboratory, Bucharest	DOVLETE
ROM/9/011	Academy of Medical Science, Institute of Hygiene and Public Health, Bucharest	MILU BUCUR
ROM/9/012	1. Ministry of Environment, Department of Environment, Institute of Environmental Research and Engineering, Environmental Radioactivity Laboratory, Bucharest	DOVLETE
	2. Ministry of Health, Bucharest	-
	3. Institute of Atomic Physics, Bucharest	PASCOVICI
ROM/9/013	Institute of Physics and Nuclear Engineering, Bucharest	IVANOV GALERIU
ROM/9/014	1. Institute for Power Studies and Design (ISPE), Department of Nuclear Programmes, Bucharest	ANDREESCU POPESCU
	2. Institute for Nuclear Research, Pitesti	ALECU
	3. Institute of Physics and Nuclear Engineering, Bucharest	PASCOVICI

COUNTERPART INSTITUTIONS IN ROMANIA (I)
(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>NUCLEAR SAFETY</u> (cont'd)		
ROM/9/015	1. Secretariat of Republican Command for Intervention in Case of Nuclear Accident, General Inspectorate for Civil Defence, Bucharest	BAETICA MOISESCU
	2. Ministry of Environment, Department of Environment, Institute of Environmental Research and Engineering, Environmental Radioactivity Laboratory, Bucharest	DOVLETE
	3. National Commission for the Nuclear Activities Control, Bucharest	DRAGOMIRESCU OLARIU
ROM/9/016	1. Romanian Electricity Authority (RENEL), NPP Division, Bucharest	BILEGAN
	2. Cernavoda Nuclear Power Plant, Cernavoda	MARCULESCU SERBAN

COUNTERPART INSTITUTIONS IN ROMANIA (II)
(By Institute)

BUCHAREST

Institute for Power Studies and Design (ISPE)
Bucharest

ROM/0/002 Energy Demand Forecasting and Electricity Expansion Planning

Institute for Power Studies and Design (ISPE)
Department of Nuclear Programmes
Bucharest

ROM/4/015 Computer-Aided Design for Cernavoda NPP Engineering
ROM/9/014 Review of Radioactive Waste Management at Cernavoda NPP

Romanian Electricity Authority (RENEL)
NPP Division
Bucharest

ROM/0/002 Energy Demand Forecasting and Electricity Expansion Planning
ROM/0/004 Support of Cernavoda Training Centre
ROM/4/017 Cernavoda NPP Project Management
ROM/4/018 Development of High Efficiency Air Filters for Cernavoda NPP
ROM/9/005 Pre-OSART Mission to Cernavoda NPP
ROM/9/008 Nuclear Safety (Phase II)
ROM/9/009 OSART and Follow-up OSART (Follow-up Pre-OSART to Cernavoda)
ROM/9/016 Nuclear Safety Review Missions

Institute of Atomic Physics
Bucharest

ROM/0/003 Manpower Development
ROM/1/003 Nuclear Physics
ROM/4/018 Development of High Efficiency Air Filters for Cernavoda NPP
ROM/8/011 Multi-Purpose Irradiation Facility
ROM/9/012 Upgrading of Environmental Radioactivity Surveillance Laboratory

Institute for Physics and Technology of Radiation Devices
Bucharest

ROM/1/005 Applied Actinide Research

COUNTERPART INSTITUTIONS IN ROMANIA (II)
(By Institute)

BUCHAREST (cont'd)

Institute of Physics and Nuclear Engineering
Bucharest

ROM/1/007	Dosimetry Instrumentation
ROM/1/009	Heavy Ion Physics
ROM/1/010	Physics of Materials
ROM/3/002	Nuclear Techniques in Mining
ROM/4/013	Development of Nuclear Detectors
ROM/8/013	Sediment Dynamics Investigation by Nuclear Techniques
ROM/9/006	Laboratory for Environmental Radioactivity Monitoring
ROM/9/013	Radiation Protection Management Programme for Tritium
ROM/9/014	Review of Radioactive Waste Management at Cernavoda NPP

Metallurgical Research Institute
Bucharest

ROM/4/009	Nuclear Materials Research
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Institute for Physics and Technology of Materials
Bucharest

ROM/2/007	Nuclear Techniques in Materials Analysis
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National Institute of Glass
Bucharest

ROM/4/018	Development of High Efficiency Air Filters for Cernavoda NPP
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Research Institute for Plant Protection
Department of Biochemistry and Bacteriology
Bucharest

ROM/5/006	Use of Beneficial Bacteria for Increased Crop Production
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Institute of Oncology
Bucharest

ROM/6/008	Nuclear Medicine
ROM/6/011	Upgrading Radiotherapy Facilities in Romania

COUNTERPART INSTITUTIONS IN ROMANIA (II)
(By Institute)

BUCHAREST (cont'd)

Institute of Endocrinology "C.I.Parhon"
Department of Nuclear Medicine
Bucharest

ROM/6/007 Radioreceptor Assay
ROM/6/010 Radioimmunoassay Standardization and Quality Control

Coltea Hospital
Clinic of Radiology-Oncology
Bucharest

ROM/6/011 Upgrading Radiotherapy Facilities in Romania

Central Institute for Chemical Research
Bucharest

ROM/8/008 Radiation Polymerization
ROM/8/010 Gamma Irradiation Facility

Institute of Chemical and Pharmaceutical Research,
Bucharest

ROM/8/011 Multi-Purpose Irradiation Facility

National Commission for the Nuclear Activities Control
Bucharest

ROM/9/003 Nuclear Safety
ROM/9/007 Licensing of Cernavoda NPP
ROM/9/015 Development of National Emergency Plan for Nuclear Accidents

Institute for Nuclear Power Reactors
Bucharest

ROM/9/005 Pre-OSART Missions to Cernavoda NPP

COUNTERPART INSTITUTIONS IN ROMANIA (II)
(By Institute)

BUCHAREST (cont'd)

Ministry of Health
Bucharest

ROM/9/12 Upgrading of Environmental Radioactivity Surveillance Laboratory

Academy of Medical Science
Institute of Hygiene and Public Health
Bucharest

ROM/9/011 Improving Radiation Safety Practices in Romanian Hospitals

Ministry of Environment
Department of Environment
Institute of Environmental Research and Engineering
Environmental Radioactivity Laboratory
Bucharest

ROM/9/010 Environmental Radiation Monitoring
ROM/9/012 Upgrading of Environmental Radioactivity Surveillance Laboratory
ROM/9/015 Developing a National Emergency Plan for Nuclear Accidents

Secretariat of Republican Command
for Intervention in Case of Nuclear Accident
General Inspectorate for Civil Defence
Bucharest

ROM/9/015 Developing a National Emergency Plan for Nuclear Accidents

PITESTI

Institute for Nuclear Research
Pitesti

ROM/0/004 Support of Cernavoda Training Centre
ROM/4/010 Assistance for Nuclear Power Stations
ROM/4/011 Provision of Enriched Uranium Dioxide
ROM/4/012 Nuclear Power

COUNTERPART INSTITUTIONS IN ROMANIA (II)
(By Institute)

PITESTI (cont'd)

Institute for Nuclear Research (cont'd)
Pitesti

ROM/4/017	Cernavoda NPP Project Management
ROM/8/011	Multi-Purpose Irradiation Facility
ROM/9/003	Nuclear Safety
ROM/9/004	Nuclear Safety
ROM/9/008	Nuclear Safety (Phase II)
ROM/9/014	Review of Radioactive Waste Management at Cernavoda NPP

CERNAVODA

Filiala Centrale Nuclear Electrica Cernavoda
Cernavoda

ROM/0/004	Support of Cernavoda Training Centre
ROM/4/017	Cernavoda NPP Project Management
ROM/9/005	Pre-OSART Missions to Cernavoda NPP
ROM/9/008	Nuclear Safety (Phase II)

Cernavoda Nuclear Power Plant
Cernavoda

ROM/9/016	Nuclear Safety Review Missions
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BAIA MARE

**Institute of Research, Technological Engineering
and Planning for Non-Ferrous Minerals and Metallurgy**
Baia Mare

ROM/1/008	X-Ray Fluorescence Spectrometry
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COUNTERPART INSTITUTIONS IN ROMANIA (II)
(By Institute)

FUNDULEA

Academy of Agricultural and Forestry Sciences
Research Institute for Cereals and Industrial Crops
Fundulea

ROM/5/004 Soil Fertility Studies

CLUJ

Oncological Institute
Cluj

ROM/6/011 Upgrading Radiotherapy Facilities in Romania

**THE AGENCY'S TECHNICAL CO-OPERATION PROGRAMME WITH
ROMANIA
SINCE 1983**

LONG-TERM EXPERT ASSIGNMENTS

NONE

RESEARCH CONTRACTS/AGREEMENTS IN ROMANIA SINCE 1983 ¹
(As of mid-October 1993)

Field of activity	No. of contracts/ agreements	Amount allocated \$
Nuclear physics	10	81 258
Nuclear engineering and technology	13	98 700
Nuclear techniques in agriculture	10	86 500
Nuclear medicine	3	32 000
Nuclear techniques in biology	3	42 000
Nuclear techniques in industry & hydrology	3	46 500
Safety in nuclear energy	10	99 835
TOTAL	52	486 793

¹/ New awards since 1983

**SCIENTISTS FROM ROMANIA SERVING AS AGENCY
TECHNICAL CO-OPERATION EXPERTS OR
TRAINING COURSE LECTURERS
1983 - 1993
(As of mid-October 1993)**

Name	No. of assignments	Project(s)
BARARIU	1	RER/9/010
BENGULESCU	1	ROM/9/008
BILEGAN	3	ROM/9/003, ROM/9/008
BODEA	2	ROM/1/009
BREAZU	1	ROM/0/002
CASOTA	1	RER/0/008
CONSTANTINESCU, B.	1	ROM/1/010
CONSTANTINESCU, L.E.	1	RER/8/003
CRACIUN	1	ROM/1/009
DOVLETE	1	ROM/9/010
FOTA	1	ROM/9/003
GAGEAN	2	RER/6/006
GALERIU	1	ROM/1/007
GEORGESCU	2	ROM/9/003, ROM/9/008
GHEORGHESCU	1	ETH/6/003
GLODEANU	1	ROM/9/003
GRANCEA	2	HAI/9/002, INT/0/053
IANCULESCU	1	ROM/9/006
INDREAS	1	ROM/1/009
INTORCATORU	1	ROM/1/009
IONESCU	1	ROM/9/007
IVANOV	1	ROM/9/013
MARCULESCU	1	ROM/9/008
MARINESCU	3	NIR/4/003, ROM/1/009

**SCIENTISTS FROM ROMANIA SERVING AS AGENCY
TECHNICAL CO-OPERATION EXPERTS OR
TRAINING COURSE LECTURERS
1983 - 1993
(As of mid-October 1993)**

Name	No. of assignments	Project(s)
MAXIM	4	RER/9/010
OLARIU, S.A.	6	ROM/9/003, ROM/9/007
OLARIU, V.	1	ROM/9/003
PECULEA	1	INS/4/017
POPA	2	ROM/9/007
POPESCU, D.	6	LIB/4/007, ROM/1/007, ROM/4/013
POPESCU, I.	1	RER/9/010
POPESCU, M.A.	1	ROM/0/002
POPOVICI	2	ROM/0/002
PREDA	2	RER/9/010
PUTINEANU	3	ROM/1/009, ROM/9/003
RACOVEANU	4	EGY/6/004
RADU	2	RER/9/010
SANDRU	2	RER/9/007, RER/9/022
STOENESCU	1	INT/5/090
TOMA	1	RER/8/003
URSU	1	ROM/1/005
VALCEREANU	2	ROM/0/002
ZAHARIA	2	RER/4/006
ZORAN	2	ROM/1/009
TOTAL	78	

**AGENCY FELLOWSHIPS AND SCIENTIFIC VISITS
HOSTED BY ROMANIA
1983 - 1993
(As of mid-October 1993)**

Recipient country	No. of fellowships	No. of scientific visits	TOTAL ¹
LIBYA	1	-	1
PAKISTAN	-	2	2
TURKEY	-	2	2
TOTAL	1	4	5

1./ Includes trainees who have completed or at least started their studies.

**REGIONAL AND INTERREGIONAL TRAINING EVENTS
HOSTED BY ROMANIA
1983 - 1993
(As of mid-October 1993)**

NONE