

# Aselsan

**Buy**

Upgraded from Hold

Price: TRY 38.56  
Price target: TRY 56.4  
(from TRY 13.75)

## Back on a USD growth path

Following Aselsan's 1H23 results and analyst day in Istanbul in August, we have updated our valuation model for the company, upgrading our rating to BUY (from Hold). Apart from a major uplift in our earnings estimates, propelling our 12M price target (PT) to TRY 56.4/share (from TRY 13.75/share, adjusted for the recent 100% stock split), the key driver of our rating upgrade is the robust ytd surge in the company's new contract wins, reaching USD 3.4bn as of end-August (eclipsing Aselsan's annual contract additions in 2019-22), and improved near-term growth prospects, on the back of sector, geopolitical and technological developments. We believe that the consensus estimates do not capture Aselsan's improved growth potential yet, and fail to grasp the technological maturity reached by the company in certain segments of the defence electronics business. Post our model update, our 12M PT, driven by our blended valuation methodology (based 60% on our DCF and 40% on the target 2024E multiples), suggests 46% upside potential.

**FY23E a watershed year for Aselsan:** having underperformed its global peers in terms of USD-based backlog and revenue growth in 2021-22, Aselsan has posted robust 24% top-line growth in 1H23 (in USD terms) and, ytd, secured USD 3.4bn in new contract wins (already exceeding its 2020-22 levels). In our view, despite these recent backlog additions, the company's near-term contract prospects remain very rich, with several domestic and export defence projects gaining momentum under a favourable local and global operating environment post the Ukraine war.

**Aselsan reaching technological maturity:** after intensive R&D investments in critical technologies, such as GaN transistors, AESA radars and advanced photonics, Aselsan recently gained technological competencies only possessed by a few global defence companies and has started to monetise this capability already (the recent USD 2bn F16 avionics contract and AESA radar deliveries are good examples). We believe this technological leap will expand the company's wallet share in the higher-end of the defence electronics market in Turkey and abroad. In our view, the street has not realised the implications of the technological maturity reached by Aselsan for the company's growth prospects.

**Estimates increased:** our 2023/24 year-end backlog assumptions are now 33% and 50% higher in USD terms, translating to 12%/15% higher revenue estimates and 16%/19% higher EBITDA forecasts for the same period (in USD terms). Our 2023E/24E NI estimates of USD 676m/685m are now 35%/22% higher. Our revised 12M PT of TRY 56.4/share is 30% higher vs. the consensus. Starting with this report, we stop using the special 15% discount factor for geopolitical risk in our PT methodology (introduced in November 2019) to reflect Turkey's improved relations with its US and NATO partners.

**Attractive valuation:** on our revised 2024E numbers, the stock is trading currently at 8.4x EV/EBITDA and 7.7x P/E, placing it at 31-57% discounts vs. its international defence electronics peers. We do not see this as justified.

### Expected events

3Q23 results	October (TBC)
DSEI London fair	12-15 September
WOOD's Winter Conference	5-8 December

### Key data

Market Cap	USD 6,565m
Free float	25.8%
Shares outstanding	4,560m
3M ADTV	USD 122m
Major Shareholder	TAF Foundation
Reuters Code	ASELS.IS
Bloomberg Code	ASELS.TI
BIST100 Index	8,141

### Price performance

52-w range	TRY 13.66-40.58
52-w performance	+181.0%
Relative performance	+11.8%

### Aselsan 12M share price performance



Year	Revenues TRY m	Adj.EBITDA TRY m	EBITDA margin (%)	NI TRY m	EPS TRY	DPS TRY	ND/EBITDA x	P/E x	EV/EBITDA x	FCFY %	DY %	ROE %
2021	20,139	5,502	27.3%	7,139	1.57	0.03	0.5x	24.7x	32.6x	-2.9%	0.1%	32%
2022	35,282	9,471	26.8%	11,916	2.61	0.09	0.5x	14.8x	19.2x	-3.5%	0.2%	36%
2023E	59,817	14,870	24.9%	16,422	3.60	0.36	0.6x	10.8x	12.5x	-0.6%	0.9%	34%
2024E	90,981	22,753	25.0%	23,011	5.05	0.50	0.6x	7.7x	8.4x	2.9%	1.3%	34%
2025E	132,768	33,229	25.0%	31,227	6.85	0.68	0.3x	5.7x	5.6x	9.1%	1.8%	33%

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## Closing Prices as of 04 September 2023

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Requests for permission to make copies of any part of this report should be mailed to:

WOOD & Company Financial Services a.s.  
Palladium, Namesti Republiky 1079/1a,  
110 00 Prague 1 – Czech Republic  
tel.: +420 222 096 111  
fax: +420 222 096 222  
<http://www.wood.cz>

# Company snapshot – BUY, 12M PT TRY 56.4

Aselsan		SHARE PRICE PERFORMANCE		COMPANY DESCRIPTION											
BUY		ASELS T		Established in 1975, Aselsan is Turkey's primary supplier of defence electronics and its largest defence contractor, with 10k employees as of 1H23. The company's main area of activity is the development and production of defence electronic systems, such as radar, guidance and electronic warfare systems, air defence systems, microelectronics, electropics and communication equipment, and the civilian application of these technologies in the fields of energy, medical imaging, transportation and automation. Aselsan has more than 25 subsidiaries and JVs in Turkey and abroad; and, as of 1H23, generated 12% of its revenues from exports.											
Bloomberg ticker	ASELS T														
Closing price (TRY)	38.72														
Price target (TRY)	56.4C														
Upside to PT	46%														
Shares outstanding (m)	4,560.0														
Market cap (USDm)	6,565														
Free float	26%														
Average daily turnover (USDm)	122.0														
52 Week performance	181%														
52 Week relative performance															
52 Week Range (TRY)	13.66-4.5E														
RATIOS															
PER SHARE RATIOS		2020	2021	2022	2023E	2024E	2025E	VALUATION RATIOS		2020	2021	2022	2023E	2024E	2025E
EPS (TRY)	0.98	1.57	2.61	3.60	5.05	6.85		EV/EBITDA	44.9x	32.6x	19.2x	12.5x	8.4x	5.6x	
BVPS (TRY)	3.97	5.67	8.74	12.47	17.46	24.20		P/E	39.7x	24.7x	14.8x	10.8x	7.7x	5.7x	
DPS (TRY)	0.02	0.03	0.09	0.36	0.50	0.68		EV, TRYm	176,376	179,475	181,710	186,148	190,608	186,210	
FINANCIAL RATIOS		2020	2021	2022	2023E	2024E	2025E	Net debt, TRYm	-188	2,912	5,147	9,584	14,044	9,646	
Gross profit margin	28.6%	33.0%	33.4%	33.0%	32.3%	32.3%		FCF, TRYm	-1,730	-5,034	-6,150	-1,110	5,036	16,060	
EBITDA margin	24.4%	27.3%	26.8%	24.9%	25.0%	25.0%		FCF yield	-1.0%	-2.9%	-3.5%	-0.6%	2.9%	9.1%	
EBIT margin	22.6%	25.2%	25.2%	23.3%	23.1%	23.1%		Dividend yield	0.1%	0.1%	0.2%	0.9%	1.3%	1.8%	
Net margin	27.6%	35.4%	33.8%	27.5%	25.3%	23.5%		FCF BREAKDOWN		2020	2021	2022	2023E	2024E	2025E
ROE	28.1%	32.5%	36.3%	34.0%	33.7%	32.9%		Adjusted EBIT	3,642	5,070	8,884	13,937	21,017	30,669	
Net debt/EBITDA	-0.1	0.5	0.5	0.6	0.6	0.3		Taxes on adjusted EBIT	0	0	0	0	0	0	
Capex as % of revenues	107%	90%	82%	89%	88%	87%		D&A charge	286	432	587	933	1,736	2,560	
D&A charge as % of CAPEX	20.8%	19.0%	9.5%	9.3%	16.7%	18.8%		Change in WC	-4,282	-8,258	-9,418	-5,896	-7,301	-3,549	
D&A charge as % of revenues	1.8%	2.1%	1.7%	1.6%	1.9%	1.9%		Capex & acquisitions	1,375	2,278	6,203	10,085	10,416	13,620	
								FCF	-1,730	-5,034	-6,150	-1,110	5,036	16,060	
COMPANY FINANCIALS															
INCOME STATEMENT, TRYm		2020	2021	2022	2023E	2024E	2025E	BALANCE SHEET, TRYm		2020	2021	2022	2023E	2024E	2025E
Revenues	16,104	20,139	35,282	59,817	90,981	132,768		PPE	2,342	3,432	6,327	12,944	18,706	25,886	
o/w Domestic	14,564	17,896	29,085	49,050	72,785	103,559		Intangible assets, net	1,555	2,268	3,531	6,066	8,983	12,863	
o/w Exports	1,540	2,243	6,197	10,767	18,196	29,209		Advances given	342	795	707	1,623	2,354	3,323	
Gross profit	4,605	6,649	11,783	19,740	29,387	42,884		Financial investments	1,183	2,149	4,288	6,518	9,975	13,432	
Marketing and sales	-281	-670	-878	-1,615	-2,456	-3,585		Accounts receivables	7,469	12,650	18,974	28,952	41,834	57,995	
Administrative	-400	-576	-1,206	-2,692	-3,639	-5,311		Others	1,614	1,944	3,918	5,955	9,114	12,271	
R&D	-283	-333	-816	-1,495	-2,275	-3,319		Total non-current assets	14,505	23,238	37,745	62,057	90,966	125,770	
EBITDA	3,927	5,502	9,471	14,870	22,753	33,229		Inventories	5,533	7,639	12,592	20,862	29,531	39,401	
EBIT	3,642	5,070	8,884	13,937	21,017	30,669		Accounts receivables	7,147	9,803	14,888	24,582	33,651	49,106	
PBT	4,885	7,204	9,899	16,721	22,314	30,281		Cash and cash equivalents	4,078	2,491	5,685	11,332	13,122	25,692	
Net tax charge (deferred tax income)	-424	-69	1,969	-319	669	908		Advances given	1,546	1,689	2,711	6,491	9,416	13,290	
Minorities	12	-3	-48	-20	-28	-38		Others	1,286	1,553	2,421	3,860	5,891	8,231	
Net profit	4,449	7,139	11,916	16,422	23,011	31,227		Total current assets	19,589	23,175	38,297	67,127	91,611	135,720	
CASH FLOW STATEMENT, TRYm		2020	2021	2022	2023E	2024E	2025E	Total shareholders equity	18,098	25,835	39,861	56,846	79,605	110,365	
Net income	4,449	7,139	11,916	16,422	23,011	31,227		LT debt	883	333	1,069	4,094	5,136	6,498	
D&A charge	286	432	587	933	1,736	2,560		Advances taken	1,636	1,929	2,157	7,887	10,511	18,002	
Change in working capital	-5,989	-10,717	-12,891	-15,838	-21,538	-19,096		Other LT liabilities	1,157	1,566	3,305	5,471	8,469	12,264	
Other adjustments	3,192	5,666	6,197	5,535	8,119	10,629		Total non-current liabilities	3,676	3,828	6,531	17,452	24,116	36,764	
Cash from operations	1,938	2,519	5,808	7,052	11,329	25,321		ST debt	3,007	5,070	9,763	16,822	22,030	28,840	
Capex and capitalised R&D	-1,375	-2,263	-4,809	-10,085	-10,416	-13,620		Accounts payables	4,251	6,039	9,775	16,470	25,313	36,938	
Dividends	-252	-103	-153	-400	-1,640	-2,298		Advances taken	1,779	611	2,160	7,898	10,525	18,027	
Others (revaluation of PPE, M&A)	-626	-1,271	-982	-2,008	-2,902	-4,016		Other LT liabilities	3,283	5,030	7,953	13,695	20,988	30,557	
Financing/other adjustments	880	-469	3,330	11,087	5,419	7,184		Total current liabilities	12,320	16,750	29,651	54,886	78,856	114,362	
Cash generated	565	-1,587	3,194	5,647	1,790	12,570		Total equity and liabilities	34,094	46,413	76,043	129,184	182,577	261,491	
Cash balance	4,078	2,491	5,685	11,332	13,122	25,692									
		2020	2021	2022	2023E	2024E	2025E			2020	2021	2022	2023E	2024E	2025E
Total revenues (TRYm)	16,104	20,139	35,282	59,817	90,981	132,768		KPIs:							
yoy growth (%)	24%	25%	75%	70%	52%	46%		Period-end backlog (USDm)	9,500	8,500	8,180	9,327	9,750	10,000	
Domestic revenues (TRYm)	14,564	17,896	29,085	49,050	72,785	103,559		New contract inflows	1,279	2,022	1,604	3,609	3,130	3,174	
Export revenues (TRYm)	1,540	2,243	6,197	10,767	18,196	29,209		Backlog/ LTM revenues (x)	4.1	3.8	3.8	3.8	3.6	3.4	
Export contribution (%)	10%	11%	18%	18%	20%	22%		Book-to-bill- ratio (x)	0.6	0.9	0.8	1.5	1.2	1.1	
Total revenues (USDm)	2,294	2,265	2,133	2,462	2,708	2,924		No of employees	8,851	9,460	9,935	10,535	11,035	11,485	
yoy growth (%)	0%	-1%	-6%	15%	10%	8%		Backlog/employee (USDm)	1.1	0.9	0.8	0.9	0.9	0.9	
Domestic revenues (USDm)	2,075	2,013	1,758	2,019	2,166	2,281		Total R&D spending/revenues (%)	21%	28%	28%	28%	28%	27%	
yoy growth (%)	3%	-3%	-13%	15%	7%	5%									
Export revenues (USDm)	219	252	375	443	542	643									
yoy growth (%)	-21%	15%	48%	18%	22%	19%									

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## Investment case – back to USD growth track, upgrade to BUY

Following our site visit to Aselsan's radar and electronic warfare facilities in Gölbaşı in late-June, and the company's recent 1H23 results release (and its analyst day in Istanbul on 17 August), we have revised our valuation model for the company, upgrading our rating for the stock to BUY (from Hold). Apart from a significant uplift in our USD-based earnings estimates, propelling our 12M price target (PT) to TRY 56.4/share (from TRY 13.75/share, adjusted for the recent 100% stock split), the key driver of our rating upgrade is the robust ytd surge in the company's new contract wins, reaching USD 3.4bn as of the end of August (eclipsing Aselsan's annual contract additions in 2019-22), its improved near-term growth prospects, on the back of sector (Turkish defence spending is poised for a recovery, after two years of muted growth, while Turkey's defence exports performance is gaining momentum), geopolitical (positive impact of the Ukraine war on global defence budgets and on Turkey's improved relations with its NATO partners), political (the 2023 elections are behind us) and technological developments (the completion of long-lasting development work by Aselsan in several state-of-the-art defence electronic systems, elevating the company to a higher technological league within the global defence electronics industry). With new orders materialising already in several Turkish defence projects as of 8M23 (such as HISAR, the MILGEM-I frigate and Turkey's F16 upgrade projects) and initial production starting in several others (such as the ALTAY tank, and new radar and electronic warfare system projects) and considering the rich list of potential contracts, we are now confident that Aselsan is set to return to a USD-based backlog and revenue growth track. We note that, since mid-2019, Aselsan's order book has been melting down continuously (from the peak of USD 10.2bn as of 1H19 to USD 7.6bn as of 9M22, before recovering to USD 8.4bn as of 1H23), due to a deceleration in new contract wins. Consequently, the company posted zero top-line growth in USD terms in 2020, followed by -1%/-6% yoy USD revenue contractions in 2021/22. We now expect Aselsan's backlog to grow to USD 9.3bn/9.75bn by 2023E/end-2024E, before reaching USD 10bn in 2025E. In our view, the consensus estimates do not reflect any of these developments and miss the enhanced growth potential of the company, as well as its improved risk-reward profile, and fail to grasp the technological maturity reached by Aselsan in certain segments of the defence electronics business. In our view, the company's technological leap in recent years has not only strengthened Aselsan's global competitiveness, but also elevated its position to the higher end of the defence electronic market in segments such as AESA radars, advanced electronics warfare systems and active platform protection systems (dominated globally by a few suppliers). Post our model update, our 12M PT, driven by a blended valuation methodology, based 60% on our DCF and 40% on target 2024E multiples, set at a 35% discount to Aselsan's global peers, suggests 46% upside potential.

To summarise, we believe:

- ✓ **FY23E is a watershed year for Aselsan's growth outlook.** Having underperformed its Western and Asian peers (which benefitted from the post-Ukraine war boost in global defence spending) in terms of USD-based backlog and revenue growth in 2021-22, Aselsan has posted robust 24% top-line growth in 1H23 (in USD terms) and reported USD 1.16bn of new contract inflows (up 137% yoy) during the same period. Moreover, in July-August, the company bagged several additional domestic and export contracts (of which the largest was a 10-year avionics contract from its sister company TAI, to upgrade Turkey's F16 fighter jet fleet), bringing its ytd contract inflows to c.USD 3.4bn, which is already the largest addition to the company's order book since the USD 4.1bn historical peak in 2018. In our view, despite the impressive backlog additions ytd in 2023, the company's near-term contract prospects remain rich, with several Turkish defence procurement programmes gaining momentum (such as the new drone projects, the serial production of the HISAR air-defence systems, and the ongoing construction of the MILGEM-I frigates) and a historically unprecedented exports push by the entire Turkish defence and aerospace industry, benefitting all players, including Aselsan (the company's recently signed MOU in Saudi Arabia related to drone maker Baykar's giant USD 3bn export deal is a very good example, in our view).
- ✓ **Local and regional developments remain supportive.** With several Turkish defence procurement projects entering serial production (the ALTAY tank, the HISAR air defence systems, the MILGEM-I class frigates, the Akinci drone, the UH70 Blackhawk local assembly programme, new radar and electronic warfare systems, etc.) and many others already in the advanced prototype testing phase (such as the SIPER long-range air defence system, the Hürjet jet trainer, the Gökbey utility helicopter, and the Kızıl Elma jet drone), we anticipate Aselsan to secure sizeable new contracts in 2024-25E. We believe that Aselsan's new contract prospects will also be supported by the company's accelerated export push (supported indirectly by the growing exports footprint of the Turkish A&D sector abroad) and its expanding activities in adjacent civilian segments (such as wind energy, smart-city

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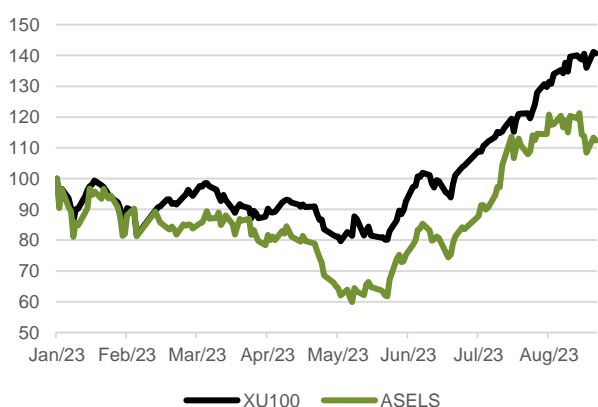
applications and railway traction systems). Following a temporary decline in 2021-22, we expect Turkey's defence spending to recover to the NATO set 2% of GDP levels in 2023-25E (daily Sabah, 222 October 2022). While Aselsan's 1H23 order book of USD 8.4bn consists of more than 400 domestic and export contracts, we note that, as of early-2023, there were more than 750 ongoing and planned projects on SSB's agenda, with an estimated value of USD 70bn to be executed in the next couple of years.

- ✓ **Aselsan is moving up the ladder in terms of technological maturity.** Following its intensified R&D and innovation efforts over the past decade, investing in critical technologies, such as GaN transistors, AI, advanced photonics and quantum computing applications in microwave systems, Aselsan has gained technological competencies possessed by only a very limited number of global defence companies, and has started to monetise this capability already (the recent USD 2bn avionics/weapons upgrade contract from TAI, to modernise Turkey's Lockheed supplied F16 jets with nationally developed equipment, such as mission computers, AESA radars, targeting pods, helmet mounted cueing systems, air-to-air missiles and electronic warfare suits, speaks for itself). Over the past year, we have also seen the company introducing several new air defence missile systems (developed jointly with its sister company Roketsan), electronic warfare and radar systems (such as GaN-based AESA or phased array radars) and platform protection systems. This technological leap, in our view, will expand the company's wallet share in the higher end of the defence electronics market not only in Turkey, but also abroad (already materialising with the recent tank upgrade contract in Chile and the MOU in Saudi Arabia for drone radar/guidance kits).
- ✓ **Recent changes at SSB and the Ministry of Defence bode well for Aselsan.** Following the May 2023 Presidential and Parliamentary elections in Turkey, Turkish defence bureaucracy has witnessed several changes that we see as favourable for Aselsan. Most importantly, in early-June, Aselsan's former CEO Mr. Haluk Görgün was appointed as the new President of Turkey's defence procurement agency SSB (this is the first time in SSB's history that a former Aselsan executive will head the agency). Mr. Görgün led Aselsan between 2018-23 and, during his tenure, had first-hand experience about the company's heightened working capital and funding needs due to delayed contract advance payments from SSB (Aselsan's largest and main client). Going forward, we believe the company's advance collection cycle could improve gradually under the new SSB leadership, helping to repair its NWC dynamics and normalise its FCF generation (during Aselsan's recent analyst day, management already flagged an improved collections performance in July and signalled that the company's ND/EBITDA should decline by the year-end compared to its 1.1x level in 1H23). Another noteworthy change is the recent appointment of former Turkish Chief of Staff, retired General Yaşar Güler, to the Minister of Defence post in June 2023. We note that electronic warfare (EW) and military communications systems were Minister Güler's area of specialisation during his military career, as he is a graduate of Turkey's Signal Corps School. Between 1997-99, he served as the Deputy Chief of Signals at NATO Regional Command in Napoli, Italy, and as the Chief of the Communications, Electronics and Information Systems Plan and Coordination Department at the Turkish General Staff, before becoming the Commander of Communications, Electronics and Information Systems Training Centre over 2003-07. Given the growing importance of the network centric war concept and electronic warfare systems in Turkey's military doctrine in recent years, and considering that some procurement decisions approved at the latest Defence Executive Committee meeting (December 2022) were related to EW systems, we believe that the appointment of a career officer specialised in this area is a favourable development for Aselsan.
- ✓ **Aselsan remains a net FX earner and beneficiary of TRY depreciation.** As of 1H23, 45% of the company's backlog consisted of domestic and export contracts denominated in USD, and 35% in EUR (and the remaining 20% in CPI-linked TRY contracts). With a cost base consisting 60% of TRY items, the company should continue to benefit from a weakening TRY trend, helping it to maintain its EBITDA margins at 24-25% in future years. We note that our macro team forecasts the USD/TRY to reach 30-31 by the 2023E year-end and surpass 40 by end-2024E, vs. the current 26-27 levels.
- ✓ **Our revised estimates are significantly above the consensus.** Following our model revisions, our 2023/24E year-end backlog assumptions are 33% and 50% higher in USD terms, at USD 9.3bn and USD 9.8bn, based on our 1.5x/1.2x book-to-bill ratio assumptions in 2023E/24E (previously 0.8x for both years). In USD terms, this translates into 12%/15% higher revenue estimates for 2023E/24E and 16%/19% higher EBITDA forecasts for the same period (compared to our previous forecasts). Our 2023E/24E NI estimates of USD 676m/685m are now 35%/22% higher. In TRY terms (despite a hard currency driven backlog and revenues stream, Aselsan reports its financials in TRY; hence, the Bloomberg consensus estimates are TRY based), our revised TRY 2023/24E earnings estimates are significantly

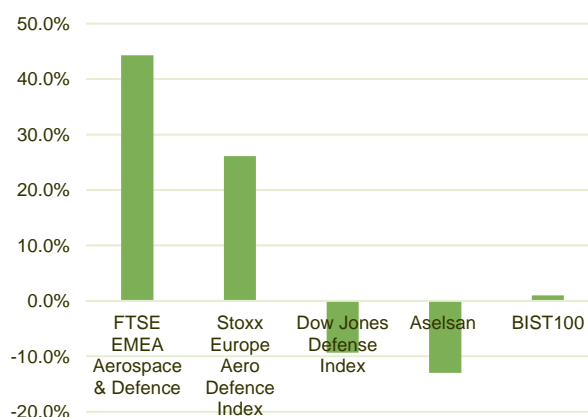
above the consensus. For 2023E, the TRY equivalent of our revenue/EBITDA and NI estimates are 8-12% higher vs. the street. For 2024E, our revenue and EBITDA/NI estimates are now 20-24% higher than the consensus in TRY terms. Consequently our revised 12M price target (PT) of TRY 56.4/share is 30% higher than the consensus PT of TRY 43.3. In our view, the wide gap between our revised TRY earnings estimates and the street's numbers may be attributable to: i) a lower USD/TRY assumption by some analysts compared to our updated in-house forecasts; but also ii) the possibly bearish stance of some brokers following Aselsan's consecutive episode of backlog and top-line contraction (in USD terms) between December 2019-December 2022. In our view, the consensus is yet to realise the significant improvement in the company's growth outlook; hence, we expect major consensus earnings upgrades in the coming quarters.

- ✓ **We remove the geopolitical discount factor from our valuation.** Starting with this report, we stop using the additional 15% special discount factor in our Aselsan valuation methodology, which was first introduced in our report, dated 27 November 2019 (*Aselsan: Is the worst over?*), to reflect heightened geopolitical risks such as the indirect impact of the selective US CAATSA sanctions imposed on the top management of Turkish defence procurement agency, SSB (Aselsan's main client), due to Turkey's procurement of the S400 air defence systems from Russia (this was a direct import transaction without the involvement of any Turkish defence procurement). Moreover, following Turkey's cross-border operation in Northern Syria in 2018-19, some NATO countries imposed certain defence technology export restrictions on Turkey, which caused delays in some ongoing defence programmes, such as the ALTAY tank project. Considering the recent improvement in Turkey's relationships with its Western partners, following the Ukraine war (over the past year, the UK, the Netherlands, Finland and Sweden have lifted their selective defence technology export restrictions), recent statements from the US Department of State that the previous CAATSA sanctions will not be applied to the new President of the SSB (former Aselsan CEO, Professor Haluk Görgün) and the Biden administration's green light at NATO's Vilnius summit to proceed with the sale of new F16 jets to Turkey, we believe that such a geopolitical risk discount is no longer justified in our Aselsan valuation.
- ✓ **Attractive valuation and risk-reward profile.** On our revised 2024E numbers, the stock is trading currently at an undemanding 8.4x EV/EBITDA and 7.7x P/E, placing Aselsan at 31-57% discounts vs. its international defence electronics peers (trading at a median 2024E EV/EBITDA of 12.2x and P/E of 17.9x, respectively, on the Bloomberg consensus estimates). We note that, as of 1H23, Aselsan has one of the highest backlog/revenue cover ratios among its global peers (the current level of its order book provides forward revenue visibility in excess of three years) and operates with a 24-25% EBITDA margin (again, one of the highest among its defence electronics peers globally), enjoys a monopolistic position in its core domestic defence market (as Turkey's designated defence electronics supplier and top R&D centre) and is not exposed to TRY depreciation risk, thanks to its 80% hard currency denominated backlog (future revenue stream) vs. its 60% TRY driven cost base. Moreover, the company's indebtedness is low (at 1.1x LTM EBITDA as of 1H23) and it carries a long FX balance sheet position.

**Aselsan: ytd relative stock performance vs. BIST100**

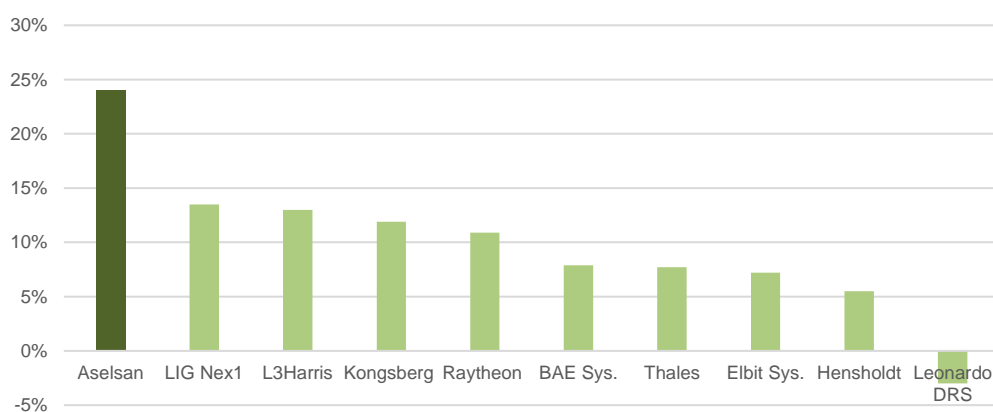


**Aselsan: ytd USD stock performance vs. major indices**



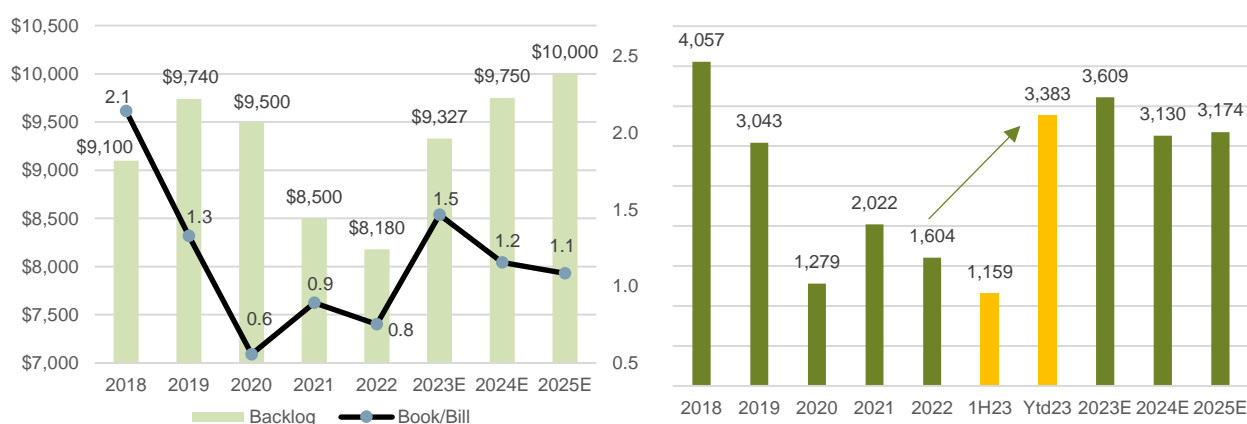
Source: WOOD Research, Matriks, FT, Stoxx, Reuters, LSE

## Selected defence electronics peers: 1H23 yoy revenue growth in USD terms



Source: WOOD Research, Bloomberg, company disclosures

## Aselsan: backlog (USD m) vs. book-to-bill ratio, 2018-25E Aselsan: new contract inflows, 2018-25E (USD m)



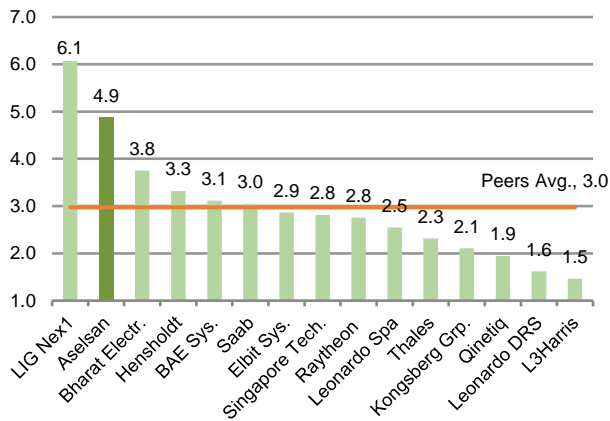
Source: WOOD Research, company data

## Aselsan: ytd major new contract wins (c.USD 3.4bn)

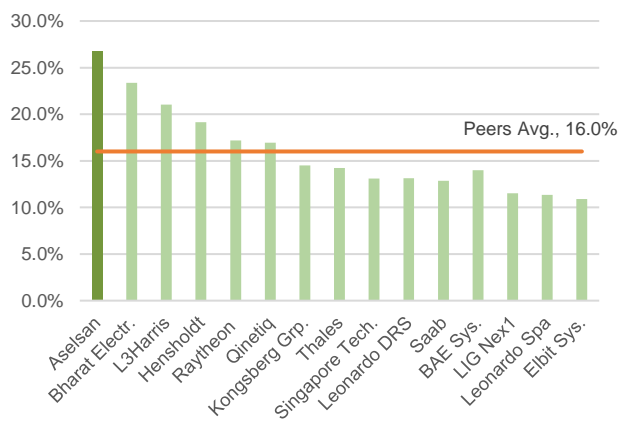
Date	Contract details	Client	Contract size (USDm)
Aug-23	Electronic warfare systems	SSB	42
Aug-23	Amendment in ongoing "city security systems" contract	SSB	109
Jul-23	Leopard-2 tank upgrade contract	Chilean Army	124
Jul-23	Turkish Air Force F16 avionics/radar upgrade subcontract	Turkish Aerospace Industries (TAI)	1,987
<b>Backlog 2Q23</b>			<b>8,394</b>
May-23	Military radio systems	SSB	87
May-23	Electro-optic systems for drones	Baykar	18
May-23	Early warning radar project	SSB	51
May-23	Radar, electronic warfare systems, avionics software development and integration	SSB	37
May-23	Avionics modernisation of Turkish Navy AB412 helicopters	SSB	84
May-23	Subsystems for main battle tanks	BMC	282
<b>Backlog 1Q23</b>			<b>8,158</b>
Mar-23	Defence systems export contract	Undisclosed export customer	19
Feb-23	Contract amendment (July 2021) - Air defence systems	SSB	41
Feb-23	Contract amendment (June 2016) - Radar systems	SSB	149
Feb-23	Border and homeland security systems	SSB	125
Jan-23	Defence systems	Undisclosed export customer	75
Jan-23	Defence electronics	Undisclosed export customer	63
Jan-23	Avionic system exports	Turkish Aerospace Industries (TAI)	58
<b>Backlog 4Q22</b>			<b>8,180</b>

Source: WOOD Research, company data

**Selected global defence electronics peers – latest reported backlog\*/FY22 revenues**

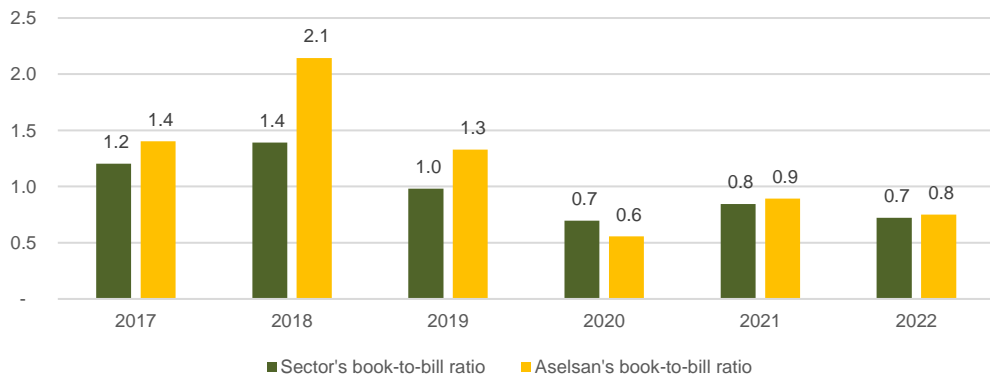


**Selected global defence electronics peers – FY22 adjusted EBITDA margin**



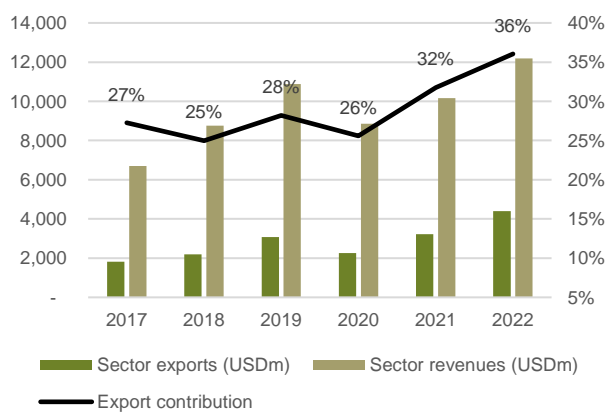
Source: WOOD Research, company data, Bloomberg; \*Aselsan 1H23 backlog adjusted for recent USD 2.1bn worth of new contracts

**Book-to-bill ratio: Turkey A&D sector vs. Aselsan, 2017-22**

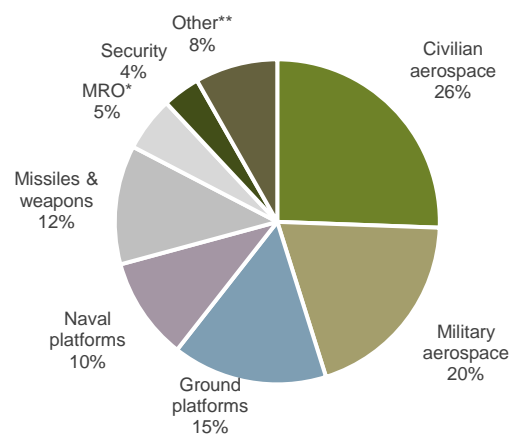


Source: WOOD Research, company data, SASAD

**Turkish A&D sector revenue and exports, 2017-22**



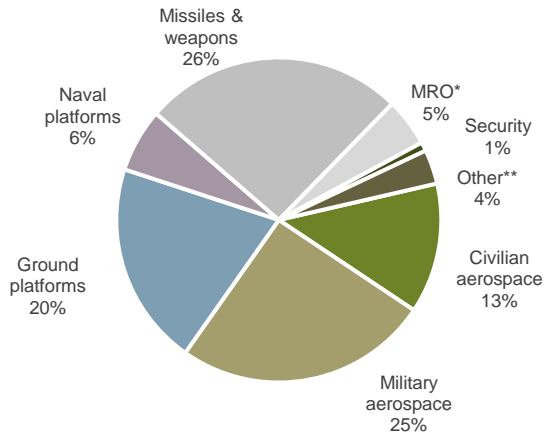
**Turkish A&D sector FY22 revenue (USD 12.2bn), breakdown by segment**



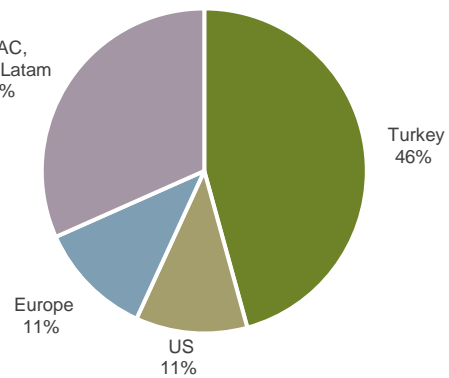
Source: WOOD Research, SASAD



**Turkish A&D sector FY22 new contracts (USD 8.8bn), breakdown by segment**

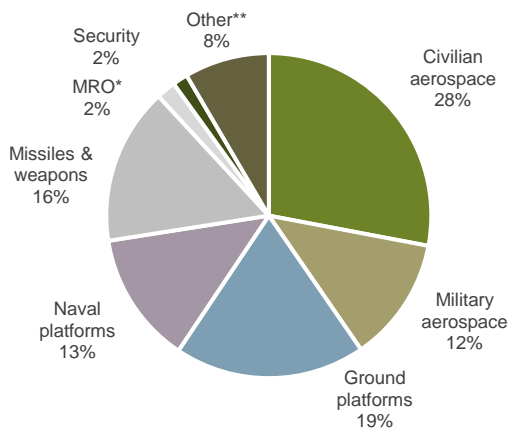


**Turkish A&D sector FY22 new contracts (USD 8.8bn), breakdown by country**

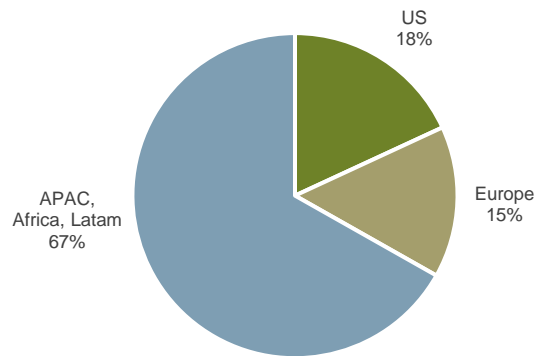


Source: WOOD Research, SASAD; \*maintenance-repair operations; \*\*C5/ISR systems, space, logistics

**Turkish A&D sector FY22 exports (USD 4.4bn), breakdown by segment**

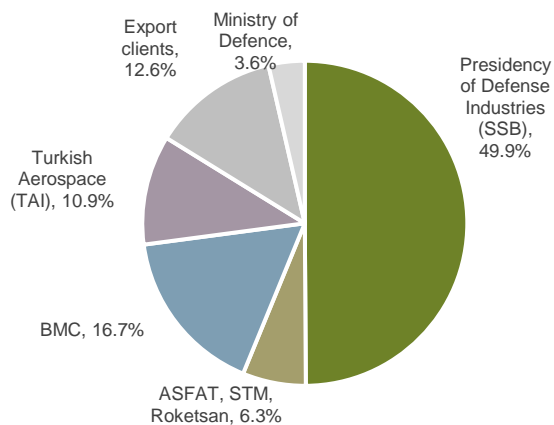


**Turkish A&D sector FY22 exports (USD 4.4bn), breakdown by country**

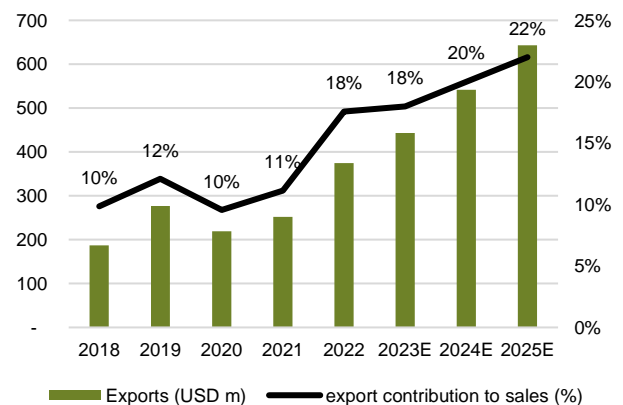


Source: WOOD Research, SASAD; \*maintenance-repair operations; \*\*C5/ISR systems, space, logistics

**Aselsan: 1H23 backlog per client (USD 8.4 bn)**



**Aselsan: export contribution to revenues, 2018-25E (USDm)**



Source: WOOD Research, company data

### Selected NATO,EU and Asian countries defence budget pledges since the Ukraine war

Country	2022 level (% of GDP)	Future target (% of GDP)	To be reached by
NATO target	2.58%	2%	
Australia	1.9%	Increase to 2.1%	2032
Belgium	1.18%	Increase to 1.54% of GDP by 2030 and 2% by 2025	2030-35
Canada	1.27%	1.51% by 2024	2024
Czechia	1.33%	Minimum 2%	2025
Denmark	1.39%	Increase to 2%	2033
Estonia	2.3%	Increase to 3%	2024-27
Finland	1.96%	Increase spending by 70% over 4 years	2022-26
France	1.9%	Increase budget by 40% and reach 2% of GDP	2027
Germany	1.44%	Increase to 2% of GDP (Eur 100bn special fund over 4 years)	2022-26
Greece	3.8%	No targets set	na
Hungary	1.55%	Increase to 2%	2024
India	2.4%	Raised FY23 budget by 13%	na
Israel	4.5%	Raised budget to NIS 68bn for FY23-24 vs NIS 58bn in 2022	na
Italy	1.54%	Increase to 2%	2028
Japan	1.08%	Increase to 2% (cumulative USD 321bn in 2023-27)	2027
Latvia	2.10%	Increase to 2.5%	2025
Lithuania	2.36%	Increase to 2.5-3%	2023
Netherlands	1.65%	Increase to 2%	2024-25
Norway	1.6%	Increase to 2%	2026
Portugal	1.44%	Increase to 1.9%	2024
Poland	2.4%	Increase to 4%	2023
Romania	1.7%	Increase to 2.5%	2025
Saudi Arabia	7.4%	No targets set	na
Slovakia	2.0%	Increase to 2%	2022
Slovenia	1.22%	Increase to 2%	2030
South Korea	2.7%	Increase 6.8% annually in next 3 years (cumulative USD 261bn)	2023-2027
Spain	1.0%	Increase to 2%	2029
Sweden	1.3%	Increase to 2%	2026
Turkey	1.2%	Increase to 1.7% in 2023 and 2% by 2025	2023-25
Taiwan	2.2%	13% yoy higher budget set for FY23	na
USA	3.5%	8% yoy increase in FY23 budget	na
UK	2.1%	Increase to 2% (GBP 11bn additional spending in 2023-28)	2023-28

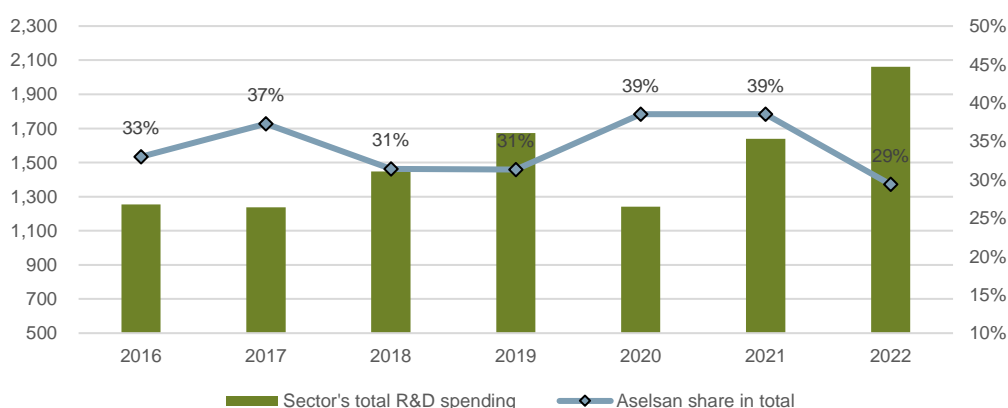
Source: WOOD Research, NATO, UK House of Commons Library, RKK International Centre for Defence and Security, Euractiv.com

## Moving up in the value chain through technological maturity

Established in 1975, to eliminate Turkey's foreign dependence in critical defence technologies, Aselsan is currently not only the country's largest defence contractor, but also its top R&D house, overtaking every other Turkish corporate in annual R&D spending. With annual R&D investments (equity and client funded) of c.USD 450-650m in the past four years, Aselsan has undertaken c.29-39% of the Turkish defence and aerospace sector's total R&D by itself.

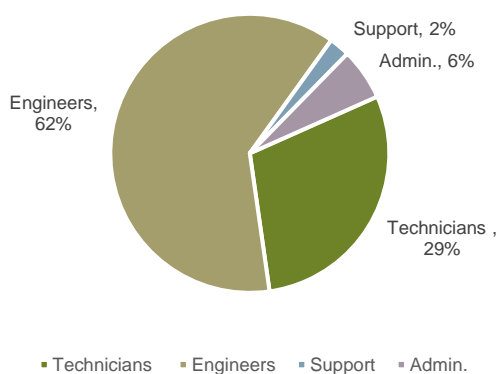
Having started its business more than four decades ago, with a foreign licence to manufacture low-tech military radio systems in Turkey, the company has never lost its focus on innovation and R&D, as part of its designated mission by the Turkish government and SSB. With technological capabilities and know-how gained via in-house R&D and participation various NATO joint production programmes, by 2005, the company had already reached a maturity level to win an international tender opened by the Royal Dutch Army for the supply of low altitude air defence missile systems (as of early-2023, the number of export destinations reached 85 countries).

### Aselsan's share in Turkey's defence and aerospace sector R&D spending (USD m)

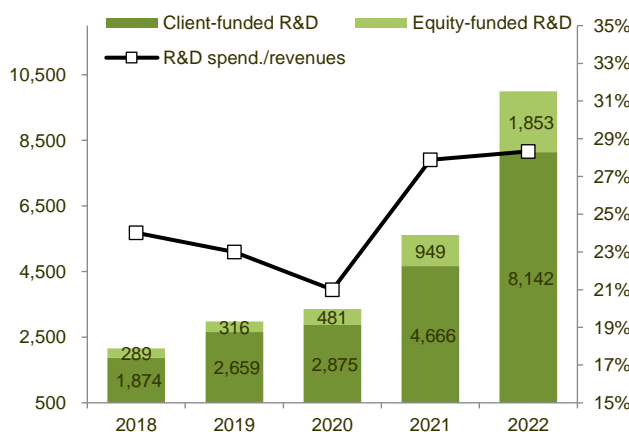


Source: WOOD Research, SASAD, company data

### Aselsan employee mix per function (10K staff) as of 1H23



### Aselsan R&D spending trends 2018-22 (TRYm)



Source: WOOD Research, company data

Over the past decade, Aselsan's technology development and innovation efforts have also been fortified by closer cooperation with 26 universities, a focused approach to attract the best engineering talent in Turkey, incentives for post-graduate studies at Aselsan Academy (in 2022, the company's in-house post-graduate university had 602 students, of which 87 were PhD candidates) and the company's "back to Türkiye" project, aimed at repatriating Turkish engineers working in defence and high-tech companies abroad. According to Aselsan's website, as of 2021, the number of active collaboration projects with universities stood at 134; while, in 2022, 47 new equity-funded R&D projects were initiated by Aselsan.

As one of the leading technology companies in Turkey, Aselsan considers innovation management a vital part of its corporate strategy, in order to maintain its technological competitiveness. The company updates its innovative strategy every year, with well-attended meetings of its employees. Innovative ideas proposed in the fields of products, services, processes, business model and organisation are

constantly collected and evaluated, and selected ideas are implemented promptly. Moreover, joint studies are carried out with Turkish universities, techno parks and scientific institutions, such as TUBITAK-SAGE. Technology management is another aspect of Aselsan's innovation and R&D efforts, and are implemented according to a strategic plan. New technology development areas to be focused on by the company are reflected in the company's technology roadmap and investment plan, shaped by in-depth analysis of emerging technologies and in coordination with SSB. This roadmap is prepared for a period of five years, and includes R&D projects and technological investment targets. Currently, there are more than 160 main technologies and approximately 1,000 sub-technologies, whose technological development is planned by Aselsan.

### Examples of new technologies acquired by Aselsan

To illustrate, some of the recent technological capabilities gained by Aselsan, thanks to its well-coordinated and far-sighted R&D strategy, we provide three noteworthy examples below:

- ✓ **GaN semiconductor investments:** having started cooperation and joint investment with Bilkent University as early as 2012, on the commercial production of the Gallium Nitride (GaN) based transistor and integrated circuit production, Aselsan's 50-50% JV with Bilkent University "AB MikroNano" was established in 2014 and started producing high-power GaN transistors in 2017, using advanced nanofabrication methods. With this capability gain, Aselsan entered a globally select group of technology companies with its own gallium foundry and GaN semiconductors.

### Aselsan: AB Mikronano\*'s GaN semiconductor foundry



Source: WOOD Research, company data; \*a 50/50 joint venture with Bilkent University

Gallium is a chemical element (symbolised as "Ga") found in trace amounts in zinc ores and bauxite; Gallium metal is also a by-product when processing bauxite to produce aluminium. According to CRMA (the European industry association "Critical Raw Materials Alliance"), roughly 80% of the global Gallium production in 2022 came from China (Reuters, 1 August) and the rest from countries such as Russia, Ukraine, Japan, South Korea and Kazakhstan. According to the US Geological Survey, the US does not have any domestic production of Gallium and relies solely on imports. High-purity Gallium is a strategic input for the global semiconductor industry, due to the high performance of Gallium arsenide (GaAS) and Gallium nitrate (GaN) based microchips (compared to silicon) in defence, space and other applications (such as 5G base stations and electric vehicles). Semiconductor wafers made with GaAS or GaN, rather than silicon, can operate at higher frequencies and temperatures (as a result, they cool faster and reduce magnetics), according to US company Wafer World. Moreover, GaN produces less noise compared to silicon chips, especially at high operating frequencies, making them ideal for radar, satellite and electronic warfare systems applications. For instance, almost all AESA radars globally in production, from Saab's land/sea based Giraffe radar to Northrop's AN-APG81 aircraft radar (integrated to F35 jets) or Raytheon's AN-APG82 radar (used in the latest F15 variants), are based on GaN technology. Likewise, some of the latest Aselsan radars, such as the Murad AESA aircraft radar and the CenK-S naval radar, use GaN semi-conductors.

As only a few companies in the US, Europe, Canada and Japan can refine Gallium to the required purity demanded by the microchip industry and given China's dominance in low-

grade Gallium production, this is a strategic material, whose supply is restricted. For instance, in 2022, global high-purity refined Gallium production was estimated at merely 290 tonnes. With widening applications of Gallium-based microchips globally (in civilian applications, such as electric vehicles, 5G networks and solar panels), German Fraunhofer Institute predicts that, by 2030, Europe alone will be consuming 7-26x more Gallium compared to the current levels. We also note that following the Biden administration's recent steps aimed at curbing China's access to US semiconductor technology, we note that, in late-August, the Chinese government has introduced export restrictions on some Gallium and Germanium products used in microchips.

**Material properties of microwave semiconductors for radar applications: GaN compared to GaAs and Silicon and Silicon Carbide**

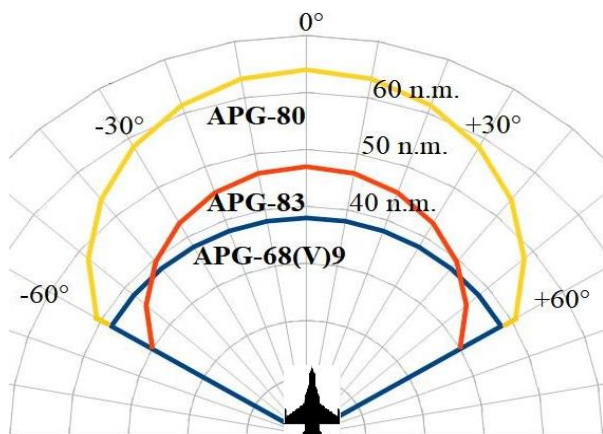
Properties	Si	GaAs	4H-SiC	GaN
Bandgap (eV)	1.11	1.43	3.26	3.42
Relative Dielectric Constant	11.8	12.8	9.7	9.0
Breakdown Field (V/cm)	2.5e5	3.5e5	35e5	35e5
Saturation Velocity (cm/sec)	1.0e7	1.0e7	2.0e7	1.5e7
Electron Mobility (cm <sup>2</sup> /V-sec)	1,350	6,000	800	1,000
Hole Mobility (cm <sup>2</sup> /V-sec)	450	330	120	300
Thermal Conductivity (W/cm-K)	1.5	0.46	4.9	1.7
Tmax (C)	300	300	600	700

Source: Research Gate, 3D GaN nanoarchitecture for field-effect transistors April 2019, Mouser Electronics

- ✓ **AESA radar technology – a must-have:** with the aforementioned advances in the semiconductor field in recent years, a new generation of phased array radars with “active electronically scanned array” (AESA) technology has emerged. Unlike its peers, with mechanically scanning antennas, an AESA radar has a computer controlled phased array antenna, which steers radar beams electronically to point in different directions without moving the antenna. In the AESA radars, the antenna is connected to thousands of small solid-state modules (TRM), functioning as a transmitter or receiver. Almost all modern AESA radars globally in production use GaN semi-conductors, due to the superior performance of GaN-based TRMs (such as lower power consumption and heat emission, better resistance to electronic jamming), compared to those employing Gallium arsenide. As AESA radars offer significant advantages regarding target acquisition speed, detection range and tracking accuracy (particularly smaller objects), the ability to track several targets simultaneously, and have low emissions (reducing the risk of detection by hostile radars), they are being integrated in the latest variants of fighter jets, radar aircraft platforms and warships. Having acquired in-house GaN and AESA technologies in recent years, Aselsan is now part of a globally select number of defence electronics companies (please see the table below) with AESA radar production capacity, and it has started to monetise this already. For example, the latest USD 2bn F16 upgrade subcontract, awarded to the company in July, includes a version of Aselsan's MURAD AESA radar, which will also be integrated in Baykar's Akinci drones and TAI's KAN national fighter jet in the longer term.

**Estimated target detection range (nm)\*: new AESA radar (APG-80/83\*\*) vs. old generation (APG-68\*\*)**

**Aselsan's MURAD AESA radar will equip both Turkish F-16s and locally-developed KAN fighters**



Source: WOOD Research; \*article published by Aircraft Engineering and Aerospace Technology magazine issue 304/2019 (estimated detection ranges vs. scan angle  $\theta$  against a target with a radar cross-section of 1sqm); \*\*developed by Northrop Grumman and Hughes Aircraft

## Defence electronics contractors with airborne AESA radar technology

Country	Company	Radar model	Aircraft integrated with
Turkey	Aselsan	MURAD	to equip Turkish F16, KAAAN fighters and Akinci UAVs
Israel	Israeli Aerospace ELTA	ELM 2052	India's Jaguar and HAL Tejas jets
		P600	Embraer P600 AEW aircraft
		ELM 2075-90 series	For various AEW platforms
S.Korea	Hanwha Systems	KF-21 AESA	Under development for KF-21 fighter programme
Japan	Mitsubishi Electric	J/APG-1 and 2	Mitsubishi F-2 fighters
		HPS-104	SH-60 helicopters
US	Raytheon Technologies	AN/APG-79	F18E/F and EA-18G
		AN/APG-80/82	F16E (UAE variant only) and some F-15 variants
		APG-63	F15 export variants
US	Northrop Grumman	AN/APG-83 SABR	F16V Block 70
		AN/APG-77	F22 Raptor
		AN/APG-81	F35 JSF
		MESA	E-7 AEW platform
Sweden	Saab	Erieye	Saab 340, Saab 2000 and Embraer R99 AEW aircraft
	Saab	AESA X-band radar	Under development (for Saab JAS39C/D fighter)
France	Thales	RBE2-AA	Rafale
Italy/UK	Leonardo	Captor-E	Eurofighter Typhoon
	Leonardo	ES-05 Raven	Saab JAS39 Gripen NG
	Leonardo	Grifo-E	M-346FA
China	Nanjing Research Institute	KLJ-5, KLJ-7, KLJ-10	JF-17 (Pakistan only) , J-20, J-10
		KJ-500/2000	For various AEW platforms
China	AVIC	LKF601E	J-11, J-16
Russia	Phazotron NIIR	Zhuk FGA-35 and 50	Development delayed (for Su-57 and Mig-35 integration)

Source: WOOD Research, producer websites, Aviation Week, IHS Jane's, The National Interest, Popular Science, The Drive

- ✓ **Active protection systems for armoured platforms:** following Turkey's first cross-border operations in Syria in 2016 ("Operation Euphrates Shield", alerting military officials about the vulnerability of tanks to guided missile attacks), Aselsan accelerated its R&D work on active protection systems (APS) for tanks to meet the Turkish Army's urgent operational requirements. In recent years, Aselsan has successfully completed the development of a family of APS (PULAT, KAMA and AKKOR) and received contracts to upgrade older generation (M60T, Leopard-2) tanks. According to Janes Defence (26 January), Aselsan's latest APS AKKOR can protect tanks against top-attack munitions with a success rate of 95% and will be the APS system of Turkey's new generation main battle tank, ALTAY. We note that, currently, only a few defence companies in the world (Rafael, IMI and Elbit in Israel, Rheinmetall in Germany, Raytheon and Lockheed in the US, Qinetiq in the UK and UVZ in Russia) produce modern APS capable of defending tanks against top-attacks. Not surprisingly, the demand for APS has peaked, following the Ukraine war (as both sides incurred heavy losses in armoured vehicles due to anti-tank missile and drone attacks). Reportedly (TRT and Defense Mirror 22 July), Aselsan's recent tank upgrade deal in Chile (USD 124m) also includes the integration of APS.

### Aselsan's radar and electronic-warfare systems test and production facility at Gölbasi is among the largest of its kind in Europe



Source: WOOD Research, SASAD, company data

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## A rich pipeline of potential contracts ahead

With several Turkish defence procurement projects entering serial production (ALTAY tanks, HISAR air defence systems, MILGEM-I class frigates, Akinci drones, Hürjet jet trainers, UH70 Blackhawk local assembly programme, new radar systems, etc.) and many other in the R&D or prototype phases, we anticipate the company to secure sizeable new contracts in the near future. We believe that Aselsan's new contract prospects will also be supported by the company's accelerated export push (indirectly supported by the growing exports footprint of the Turkish A&D sector abroad) and its expanding activities in adjacent civilian segments (such as wind energy, smart-city applications and railway traction systems) and the recovery in Turkey's defence spending to 2% of GDP in 2023-25E (daily *Sabah*, 22 October 2022). While Aselsan's 1H23 order book of USD 8.4bn consists of more than 400 domestic and export contracts, we note that, as of early-2023, there were more than 750 ongoing and planned projects on SSB's agenda, with an estimated value of USD 70bn, to be executed in the next couple of years. For the near future (the 4Q23-FY24 period), we believe that the most likely contract opportunities for Aselsan can be summarised as follows:

- ✓ **Potential Saudi electronics contract for Akinci drones:** following Turkish drone producer Baykar's USD 3bn contract with Saudi Arabia's State-owned SAMI to produce the Akinci long-range combat drones locally, Aselsan and its sister company Roketsan signed a MOU with Saudi NCMS in early-August. The MOU's scope is to facilitate cooperation between NCMS and the two Turkish companies for the integration of Aselsan-developed electro-optic sensors, guidance kits and Roketsan's smart munitions for Akinci drones, to be produced for the Saudi Air Force. While there is no publicly available data regarding the potential size of the Saudi subcontract for Aselsan, considering the magnitude of the drone contract (USD 3bn), we estimate that it could be at least a few hundred million dollars in size. We also note that the Akinci long-range combat drone is the latest addition to Baykar's UAV portfolio and, so far, it has secured orders from six countries (vs. Baykar's world famous, but smaller, tactical drone, TB2, exported to 25 countries). With a higher payload capacity (1.3 tonnes vs. TB2's 150kg), a higher service ceiling (45k feet vs. 27k feet), and significantly longer range (7,500km vs. the TB2's 300km), Akinci is able to accommodate a diverse selection of weapon configurations, including long-range stand-off cruise missiles, such as Roketsan SOM. This makes Akinci suitable for missions assigned previously to larger manned fighter aircraft jets, such as strike, anti-shipping or the suppression of enemy air-defence, in addition to electronic warfare, surveillance and other missions. In our view, similar to the recent Saudi case, future Akinci operators may also order Aselsan's electronic warfare systems, radar and guided munitions. For instance, in late-August, Aselsan received a USD 36m contract from Baykar for the integration of TOLUN precision guided munitions to Akinci drones, ordered by an export customer.
- ✓ **Potential AESA radar contracts:** according to the company's CEO, Mr. Ahmet Akyol (Savunmasanayiist.com, 1 September), Aselsan's latest addition to its airborne radar portfolio, the MURAD active electronically scanned array (AESA) radar, will not be integrated only in the Turkish F16 fleet (already included in the company's recent USD 2bn TAI contract) or, in the future, in the TFX Kaan fighter aircraft (under development) ,but its different variants will also be used in TAI's Hürjet light fighter jets, Baykar's Akinci and Kızıl Elma combat drones. Reportedly, the integration work of Aselsan's AESA radar to Akinci started in early-2023 and, when completed, Akinci will become the first combat drone with the AESA radar, giving the aircraft the capability for real-time target updates and beyond-visual range air-to-air engagement.
- ✓ **MILGEM-I (Istanbul class) frigate electronics subcontract:** following the Turkish Navy's MILGEM Ada class corvette programme (completed between 2007-19), the next phase of MILGEM started in 2017, with the Istanbul (I-class) frigates. Unlike the smaller Ada class corvettes, the I-class frigates are produced with close to 70% local industry contribution, as several foreign supplied weapons and electronic systems of the ships have been replaced with national systems, developed over the past decade. Some of the Aselsan developed systems integrated in the I-class frigates include three different radar systems, the X-band satcom, various electro-optics, hull-mounted and towed sonars, torpedo countermeasure systems, STOP and Gökdeniz close air defence systems, and the navalised version of HISAR surface to air missiles. While Aselsan secured c.EUR 75-80m of subcontracts per ship in the first phase (Ada class corvettes) of the MILGEM programme, due to the abovementioned developments, we anticipate the company's workshare per ship to be elevated to above EUR 120m. For instance, in February 2020, Aselsan received a subcontract of USD 110m for the first I-class frigate TCG Istanbul (which will be commissioned in September 2023). In January 2023, SSB signed a contract for the construction of three additional I-class frigates with a consortium of State-owned STM and several private shipyards. Thus, the construction

and systems integration of these warships will be subject to an accelerated calendar, with targeted deliveries in 2026-27. Hence, we expect Aselsan to receive a follow-on contract worth EUR 300-350m in the coming quarters. We note that the export version of MILGEM (to Pakistan and Ukraine) had a different configuration, due to client-specific requirements, which resulted in a lower workshare for Aselsan (in 2019, the company received a EUR 177m subcontract for four Ada class corvettes, implying a lower EUR 44m contract per ship). Given that STM and Koc Holding's RMK shipyards are currently building two Ada class corvettes (with an option for two more) for the Ukrainian Navy, and the reported interest of the Malaysian Navy (May 2023, Anatolian Agency) in the MILGEM programme, we would not rule out the possibility of Aselsan securing defence electronics contracts for export versions of MILGEM in the future.

#### Turkish Navy's MILGEM-I class frigates production timetable

Hull No	Ship name	Shipyard	Keel laying	To be commissioned in	Status
F-515	TCG <i>Istanbul</i>	Istanbul Naval Shipyard Command	July 2017	September 2023	Delivered / in sea trials
F-516	TCG Izmir	Anadolu shipyard – STM	2023	2026-2027	Under construction
F-517	TCG Izmit	Sedef shipyard – STM	2023	2026-2027	Under construction
F-518	TCG Icel	Sefine shipyard – STM	2023	2026-2027	Under construction

Source: WOOD Research,

- ✓ **HISAR air defence systems – add-on contracts:** in 2011, Aselsan and its sister company Roketsan were awarded an R&D contract (Aselsan's share was USD 800m) to develop an integrated air-defence missile system (HISAR) for the Turkish Armed Forces. In 2019 and 2021, Aselsan received two additional contracts worth c.USD 480m for the serial production of the initial HISAR systems, and the initial deliveries of the low altitude variant (HISAR-A) was completed in July 2021, while the deliveries of the medium altitude version (HISAR-O), started in early-2022, will continue throughout 2023. However, during the December 2022 Defence Executive Committee (SSIK) meeting, a decision on the serial production of additional HISAR-O missile batteries was made. Considering that the Turkish Army/Air Force needs several additional batteries of HISAR-O, while the naval version (HISAR-D) will be equipping the Turkish Navy's I-class frigates, we believe that the potential workshare of Aselsan from the expected add-on contract could be higher than the company secured in the initial production batch. Furthermore, considering Roketsan's USD 500m contract with Indonesia (November 2022), including the development of a localised version of the HISAR systems, we would not rule out HISAR export subcontracts for Aselsan electronics in the near future.
- ✓ **SIPER air defence systems – serial production:** having failed to acquire a long range air defence system capable of intercepting high flying aircraft and ballistic missiles from its NATO allies since 1990s and faced with a growing ballistic missile threat (Iran/Russia) in its region, Turkey initiated the development of an indigenous high altitude long range air defence missile system in 2017. Similar to the HISAR programme, R&D work was awarded to the Aselsan-Roketsan duo, supported by TUBITAK-SAGE (Turkey's defence industries R&D institute). The initial test firing of the first SIPER prototype was carried out successfully in 2021. Following further development work throughout 2022-23 (with a successful interception range of 100km attained recently), the initial variant of the SIPER system is now ready for serial production. While the development work for more advanced versions (capable of intercepting ballistic missiles) will continue, according to the latest SSİK committee decisions, a production contract for block-1 of SIPER is expected to be awarded in the near future.
- ✓ **New electronic warfare (EW) system contracts:** according to the latest SSİK committee decisions (daily Milliyet, 20 December 2022), electronic warfare systems is another area where new equipment orders will be given. This is a niche segment, which is dominated by Aselsan and its smaller peer Meteksan; and, based on press reports (Defence Turkey, 16 May 2022, 29 July and 2 August 2023), we believe that new electronic attack and support systems, such as Aselsan's KORAL-II and Ilgar-II mobile EW systems, may be on SSB's shopping list. However, we note that Aselsan's electronic warfare contracts have, historically, been smaller deals (USD 40-65m in size over the past five years). Very recently (August 2023), the company signed a USD 42m EW contract with SSB and, in our view, more may follow in the next couple of quarters.
- ✓ **New radar system orders:** in December 2022, the SSİK committee also approved the procurement of additional radar systems, without disclosing the specific type of radars to be procured. Having developed more than 40 radar systems, with different technologies, for a variety of applications since the 1990s, and having completed major technological, R&D and production investments, the company currently operates one of the largest radar and EW



systems development and testing facilities in Europe, at its Gölbaşı campus in Ankara. Apart from the earlier-mentioned AESA aircraft radar (for which the company secured initial contracts related to the Turkish F16 upgrade project in July 2023), the company is developing several other radar systems currently, including a multi-functional phased array radar (CAFRAD) for the Turkish Navy's air defence warfare destroyer programme, and has already integrated the first CENK-S AESA radar into the Turkish Navy's first I-class frigate TCG Istanbul (we note that three additional I-class frigates are under construction; hence, follow-up orders for Cenk-S are highly likely). Moreover, Aselsan delivered the first example of its air traffic control radar, HTRS, to the Turkish Air Force in December 2022; reportedly, 11 additional HTRS systems will be set up across Turkey by the end of 2024E (daily Hürriyet, 9 December 2022). Recently, at the 2023 IDEF defence fair in Istanbul (25-28 July), the company displayed its new generation S-band AESA early warning radar (EIRS), which will start entering the Turkish Air Force inventory in the coming months. For the year-to-date, c.USD 230m of Aselsan's USD 3.4bn new contracts are related to radar systems. Considering the multiple new radar projects on SSB's agenda and the company's strategic roadmap to acquire more advanced radar technologies in the medium term, we expect Aselsan to secure other R&D and serial production contracts in the radar segment in the coming period.

#### Aselsan: EIRS early warning radar

#### Aselsan: KORAL EW system



Source: WOOD Research, company data

- ✓ **Platform upgrade contracts – export opportunities:** having developed modern electro-optics, active/passive platform protection suits, encrypted communication and fire control systems in Turkey's ALTAY main battle tank and ATAK helicopter programmes, Aselsan has been monetising this capability in adjacent platform modernisation segment by upgrading older generation tanks and aircraft with modern systems both in Turkey (upgrade of M60 and Leopard-2 tanks) and abroad (Bahrain, Chile, Kazakhstan and Ukraine). Most recently in July 2023, Aselsan was awarded a USD 124m contract for modernisation of Chilean Army's Leopard-2 tanks and a USD 84m avionics upgrade contract for Turkish Coast Guard's AB412 helicopters. In our view, one of the key lessons of the ongoing war in Ukraine, was illustrating the vulnerability of old generation armoured vehicles and helicopters to modern guided missile attacks. Considering the long waiting lists for modern platforms and their prohibitive price tags, we believe several militaries in NATO and APAC region will opt to modernise their existing platforms with modern sensors and sub-systems as a stop-gap solution creating an opportunity for companies like Aselsan, Elbit Systems, Rafael and Rheinmetall active in platform upgrade segment. We believe, a key potential contract for Aselsan in the near future could be related to Azeri Air Force's recently signed upgrade programme with TAI to modernize country's Soviet legacy SU-25 attack jets with modern navigation and targeting systems and smart-munitions. (We expect TAI to subcontract Aselsan for avionics and guidance kits component of this project).

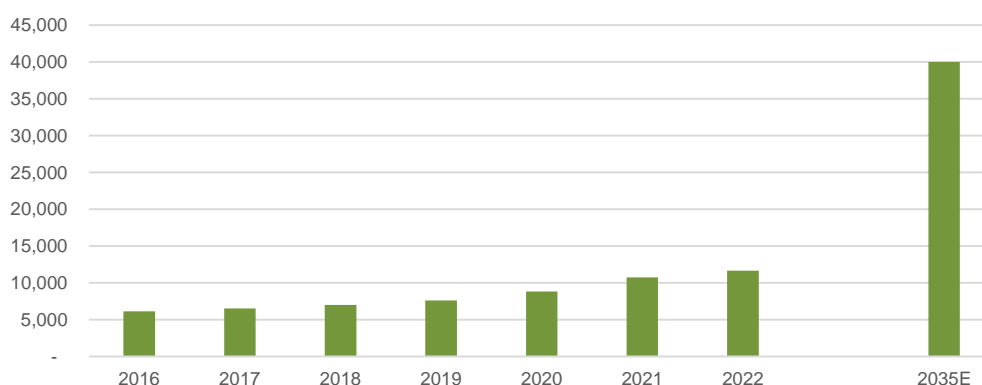
**Reconfigured ALTAY tank uses multiple Aselsan components, including active protection, laser warning systems, remote controlled weapons station and electro-optics**



Source: WOOD Research, Aselsan, defenceturkey.com

- ✓ **Potential orders for wind turbine equipment:** as part of its activities in non-defence segment (including existing activities such as development of railway traction systems, electric vehicle traction control units, medical imaging devices, toll way management systems), Aselsan has recently introduced its generator, power converter, turbine control system and SCADA software for wind power (WPP) applications (daily Dünya, 25 July). Reportedly, as part of an initial agreement with state-owned power generation company EUAS, the company started installation works for two prototype wind turbines of 9MW capacity at EUAS's wind energy farm in Alaçatı, İzmir. Considering Turkey's government's focus to develop the country's renewables potential and its efforts to lower the share of imported technologies and capital goods to curb its CA deficit, we think supportive policies will facilitate Aselsan's potential entry into this new segment. According to Turkish wind energy investors' association TUREB (25 December 2022, daily Dünya), the country has reached 11,640MW of installed WPP capacity as of the end of 2022 vs 6,135 MW as of 2016 year-end. However, considering Turkey's hypothetical wind energy capacity of 200 GWs and TUREB's plans to expand the country's WPP capacity to 40 GW by 2025 with annual investments of 3GW, and several Turkish and foreign firms producing components in Turkey for WPPs, we think the potential for Aselsan in the wind energy equipment market could be significant. According to Aselsan management's comments during its 1H23 analyst meeting in July, the initial WPP equipment contract could be close to USD 500m.

**Turkey: development of installed WPP capacity (MWs), 2016-22, vs. 2035 TUREB target**



Source: WOOD Research, TUREB

- ✓ **Indirect export opportunities:** over the past five years, Aselsan's export revenue contribution was around 10-12% of its top line; in FY22, this climbed to 18% (USD 375m, vs. USD 187m in 2018). Apart from its direct export activities, we note that the company also benefits from platform and system exports of other Turkish defence companies, such as Roketsan (uses Aselsan's seekers, guidance kits and radar systems for its missiles and rockets), TAI (avionics, radar, communication and navigation systems for fixed and rotary wing aircraft), and BMC, Otokar, Baykar and STM equipping their platforms with Aselsan

supplied electro-optics, EW systems, remote controlled weapons stations, and active and passive protection systems.

With geographically diversifying the export penetration of a maturing Turkish defence and aerospace industry, we believe that such cross-selling opportunities may emerge more often in the future. According to US defence sector periodical Defense News' "Top-100 Defense Companies" rankings, Turkey had four companies ranked among the top-100 global defence companies (in terms of 2022 revenues). Ranked 47th in the 2022 survey, Aselsan is the leading position among the Turkish contractors included in the list, along with TAI, Roketsan and ASFAT (a consortium of State-owned military factories and shipyards). However, we note that, despite its USD 1.2bn top line in 2022 (almost entirely from the export of military drones), Turkey's leading drone producer, Baykar, did not participate in the Defense News survey. While this list was dominated, historically, by US defence contractors (56 out of 100 companies were American in 2022), followed by some European countries (in the 2022 rankings, France had six, the UK five and Germany four contractors on the list), that Turkey now has five companies (including Baykar) among the world's largest 100 defence contractors, reveals the significant advances of the local defence and aerospace industry over the past decade (in 2012, Turkey had only two companies in the "Defence News Top 100" list).

#### Turkish companies' rankings in Defense News Top-100 list

Company	2023 rank	2022 rank	2022 defence revenue (USDm)	2021 defence revenue (USDm)	% of Revenue from defence
Aselsan	47	49	2,009	2,250	93%
Turkish Aerospace Industries (TAI)	58	67	1,484	1,303	81%
Roketsan	80	86	873	814	100%
ASFAT	100	na	444	178	100%
Baykar*	na*	na*	1,180	na	na

Source: WOOD Research, Defense News, TRT; \*Baykar did not participate in the Defense News survey

#### Turkish defence & aerospace sector: top exporters, 2021-22 (USD m)

Company	Activity area in defence & aerospace sector	Exports 2022	Exports 2021	chg %
Baykar	Unmanned aircraft production	1,171	638	84%
TAI	Aircraft , helicopter and aerostructures production	594	359	65%
Aselsan	Defence electronics R&D and production	375	252	49%
TEI	Aerospace engines production	251	208	21%
BMC	Armoured vehicles, tanks production	242	118	105%
PW-THY Teknik	Aircraft engine maintenance and repair services	239	99	141%
Otokar	Armoured vehicles, tanks production	166	223	-26%
RMK RAM	Naval ship production	149	224	-33%
ADIK	Naval ship production	140	88	59%
Alp Aviation	Aerospace parts, dynamic components production	112	129	-13%
Nurol Makina	Armoured vehicles, tanks production	101	54	87%
Roketsan	Missiles, rockets, smart munitions production	89	117	-24%
FNSS	Armoured vehicles, tanks production	51	na	nm

Source: WOOD Research, company data for Aselsan and Otokar figures, Turkish Exporters Association for the rest

## Turkish defence & aero sector: major export deals, 2018-23

Date	Company	Customer country	Contract size	Exported system/platform
Jul-23	TAI	Azeri Air Force	na	Avionics and weapons upgrade of SU-25ML ground attack jets
Jul-23	Baykar	Saudi Arabia	Over USD 3bn	Akinci long range combat drones and control stations
Jul-23	Aselsan	Chilean Army	USD 124m	Upgrade of Leopard-2 tanks with modern sensors
Jul-23	Baykar	Ukrainian Min. of Defence	na	Agreement to set up a drone maintenance centre in Ukraine
Jun-23	Baykar	Kuwait Navy	USD 367m	Bayraktar TB2 tactical drones and associated subsystems
May-23	Otokar	Undisclosed	USD 41m	4x4 armoured tactical vehicles
May-23	Nurol Makina	Undisclosed (in Africa)	USD 37m	4x4 armoured tactical vehicles
May-23	TAI	Malaysian Air Force	USD 100m	3 ANKA long range drones, satnav and radar systems
Apr-23	Baykar	Ukrainian Min.of Defence	na	Export contract for undisclosed systems
Feb-23	Otokar	Undisclosed	USD 54m	4x4 armoured tactical vehicles
Feb-23	TAI	Indonesian Navy	USD 300m	12 ANKA long range drones, sensors and control stations
Jan-23	Aselsan	Undisclosed	USD 75m	Defence systems
Jan-23	Aselsan	Undisclosed	USD 58m	Avionics systems for TAI aircraft platforms
Jan-23	Aselsan	Undisclosed	EUR 59m	Unspecified defence electronics
Nov-22	Havelsan	Indonesian Navy	USD 60m	ADVENT battle management system
Nov-22	Roketsan	Indonesian Army	Eur 500m	Khan rockets, HISAR air defence and Atmaca anti-ship missiles
Nov-22	Otokar	UAE Army	USD 49m	Defence vehicle spare parts and maintenance contract
Oct-22	TAI	Algerian Air Force	na	6 Aksungur long range drones
Sep-22	Baykar	UAE Air Force	na	20 Bayraktar TB2 tactical drones and smart munitions
Sep-22	Baykar	Romanian Army	USD 321m	18 Bayraktar TB2 tactical drones and smart munitions
May-22	Otokar	Undisclosed	USD 34m	4x4 armoured tactical vehicles
May-22	TAI	Kazakhstan Army	Est. USD 800m	33 ANKA long range drones to be locally assembled
May-22	TAI	Libya Air Force	na	6 Hürkuş-B trainer aircraft
Mar-22	Baykar	Pakistan Air Force	na	Akinci long range combat drones and control stations
Dec-21	Roketsan	Bangladesh Army	na	TRLG-230/300 guided artillery rocket systems
Nov-21	Aselsan	Undisclosed	USD 75m	Border security and radar systems, communication equipment
Sep-21	Baykar	Ukrainian Air Force	na	24 additional Bayraktar TB2 tactical drones and smart munitions
May-21	Baykar	Polish Air Force	na	24 Bayraktar TB2 tactical drones and smart munitions
Apr-21	Baykar	Morocco Air Force	USD 70m	13 Bayraktar TB2 tactical drones
Mar-21	Vestel Defense	Saudi Arabia	na	40 Vestel Karayel-SU drones to be assembled locally
Feb-21	TAIS consortium	Indian Navy	USD 2,300m	5 Fleet support vessels of 45K tons
Dec-20	STM	Ukrainian Navy	USD 259m/ship	2 firm and 2 optional Ada class MILGEM corvettes
Nov-20	Aselsan	Undisclosed	EUR 118m	Defense equipment
Oct-20	Otokar	Undisclosed African country	USD 110m	ARMA 8x8 and Cobrali 4x4 armoured vehicles
Jul-20	TAI	Philippines Air Force	USD 269m	6 T129B Attack helicopters and logistics support equipment
Jun-20	Baykar	Azeri Air Force	na	24 Bayraktar TB2 tactical drones and smart munitions
Mar-20	TAI	Tunisian Air Force	USD 240m	5 Anka long range drones and satnav equipment
Apr-19	FNSS	Indonesian Army	USD 135m	Joint development and production of 18 Kaplan MT medium tanks
Jan-19	Baykar	Ukrainian Navy	USD 69m	6 Bayraktar TB2 tactical drones and smart munitions
Feb-19	Aselsan	Undisclosed	USD 241m	Avionics exports
Sep-18	ASFAT/STM	Pakistan Navy	Eur 1,000m	4 Ada class MILGEM corvettes
Mar-18	Ares shipyards	Qatari Navy	USD 200m	9 Hercules offshore patrol vessels and ARES80 fast attack boats
Mar-18	Yonca OnuK shipyards	Qatari Navy	na	8 MRTP 24 fast attack boats
Sep-18	STM	Pakistan Navy	USD 350m	Agosta 90B class submarine modernization contract

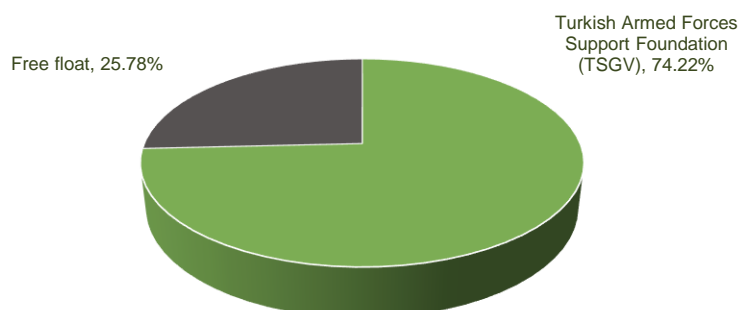
Source: WOOD Research, Defense News, Anatolian Agency, Dunya, TRT, Overt Defense, Savunmasanayist.com, Aviation Week, IHS Jane's Defense, Reuters, Bloomberg

## Recent management changes

During 2023, there have been two major changes on Aselsan's executive management team:

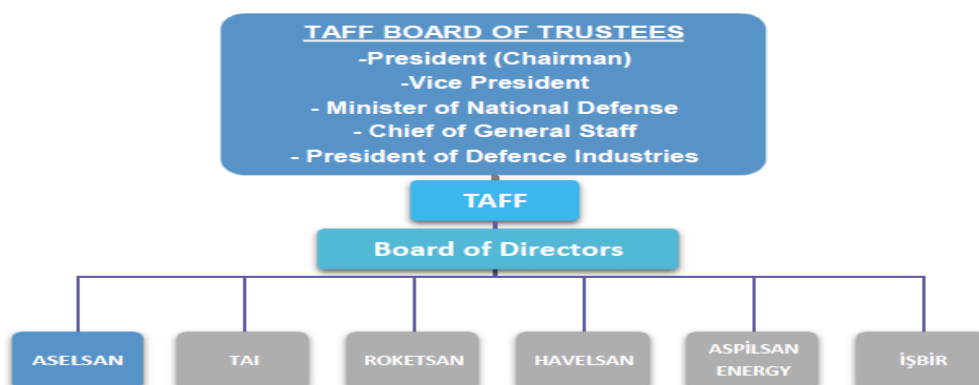
- ✓ **New CEO, Mr. Ahmet Akyol:** following the promotion of former Aselsan CEO Professor Haluk Görgün as the new SSB President (Turkey's defence industry coordination and procurement agency) in early-June, the company's BoD appointed Mr. Ahmet Akyol as the new CEO on 22 June. Mr. Akyol has been the assistant CEO of Aselsan, in charge of the MGEO (microelectronics guidance and electro optics) division, since June 2022 and has close to 20 years of engineering and management experience in the Turkish defence sector, including various posts at the Ministry of Defence, SSB, Scientific Research Institute TUBITAK, simulation systems developer Havelsan and its US computer graphics subsidiary Quantum3D. Between 2018-22, he led several critical defence projects as the head of SSB's communications, radar and electronic warfare departments. Mr. Akyol also represents Turkey at NATO's Science and Technology Organisation, and is a board member at the Turkish R&D institute for defence industries (TUBITAK-SAGE). A graduate of Kocaeli University department of computer engineering, Mr. Akyol attended post-graduate studies on innovation leadership at Stanford University and on electro-optic and telecommunication areas at Cranfield University.
- ✓ **New CFO, Mr. Yunus Poyraz:** following the retirement of Aselsan's previous CFO (Mr. Mehmet Fatih Güçlü) in March 2023, the company's BoD appointed finance director Mr. Yunus Poyraz as the new CFO. Graduating from Bilkent University industrial engineering department in 2006, Mr. Poyraz also holds a master's degree in advanced finance and management from Columbia University. Having started his professional career at the Undersecretariat of Treasury in 2006, he worked in the Strategy Development Department, until his move to the General Directorate of State Owned Enterprises (2010-13). Following a consultancy post at the OECD General Directorate of Trade and Agriculture in France, he returned to the Turkish Treasury in 2014. Between 2018-21, he was first an advisor and, later, an executive director at the Turkish Central Bank. He joined Aselsan in May 2021, as finance director, and was appointed as the company's CFO and Vice President, effective as of 6 March 2023.

## Aselsan: ownership structure as of 1H23



Source: WOOD Research, company data

## Parent TSGV board structure and major subsidiaries as of 1H23



Source: WOOD Research, company data

## 2Q23 results – a major pick-up in contract inflows and guidance uplift

Aselsan reported its 2Q23 results on 15 August and hosted an analyst day on 17 August in Istanbul. Except for a TRY 1.2bn tax charge (related to the one-off additional corporate tax introduced by the Turkish government following the February 2023 Kahramanmaraş earthquake), depressing the reported 2Q23 NI line, the reported numbers were in line with the consensus expectations.

### Key highlights

- ✓ The company's quarterly revenues were up 51% yoy in TRY terms in 2Q23 (12% in USD terms), bringing the 1H23 top-line growth to 67% (24% in USD terms).
- ✓ The EBITDA margin expanded qoq to 25.5% in 2Q23 (vs. 23.0% in 1Q23) and was almost stable yoy (25.8% in 2Q22). The EBITDA increased by 49% yoy in 2Q23 and 62% in 1H23.
- ✓ The reported NI was up 49% yoy, depressed partly by the aforementioned one-off earthquake tax charge (in 2H23, we expect Aselsan to incur net deferred tax income, driven by its long-term R&D tax incentives, in line with previous years).
- ✓ As of 1H23, Aselsan's backlog was up 6% yoy, to USD 8.4bn. However, we note that, after the 1H23 close, the company secured an additional USD 2.3bn worth of new contracts (including a huge USD 2bn F16 avionics/radar upgrade contract signed with sister company TAI on 13 July).
- ✓ During 2Q3, new contract inflows accelerated yoy/qoq, at USD 776m (up 151%/103% yoy/qoq), implying a very high 1.7x book-to-bill ratio. In 1H23, new contracts climbed 137% yoy, to USD 1,159m, representing a book-to-bill ratio of 1.3x vs. 0.7x in 1H22.
- ✓ Although Aselsan's net debt position climbed significantly during 2Q23 (up 123% yoy/117% qoq), bringing the company's ND/EBITDA to 1.1x as of 1H23 (vs. 0.5x as of end-2021/2022 and a net cash position prior to that), based on Aselsan's CFO's comments during the analyst day, stating that post the May-2023 elections and the appointment of the new Cabinet in June, the company's collections from its main client, SSB, have accelerated and this should be reflected positively in the company's net debt position at the year-end (on our revised forecasts, we expect the company's year-end ND/EBITDA ratio to be 0.6x).

Following its 2Q23 earnings release, management upgraded its FY23E guidance and now targets TRY-based annual revenue growth of 65% (previously 40%), an EBITDA margin target of +24% (unchanged) and a capex (including capitalised R&D) budget of TRY 10bn (unchanged). Considering that the consensus FY23E revenue growth estimates for FY23E stand at 54% and the EBITDA margin at 25%, we expect to see some consensus earnings (and PT) upgrades in the near future. Our revised top-line growth assumption for FY23E stands at 70% (TRY terms), while our updated EBITDA margin estimate is 24.9%. Our 2023E capex estimate is TRY 10.1bn, vs. the consensus forecast of TRY 9.9bn.

### Aselsan: 2Q23 and 1H23 results summary

In TRYm (unless otherwise stated)	2Q22	1Q23	2Q23	yoy	qoq	Cons.(E)	Diff.	1H23	1H22	yoy
<b>Revenues</b>	<b>6,476</b>	<b>8,297</b>	<b>9,770</b>	<b>51%</b>	<b>18%</b>	<b>9,948</b>	<b>-2%</b>	<b>18,067</b>	<b>10,841</b>	<b>67%</b>
Domestic revenues	5,527	7,632	8,239	49%	8%	na		15,871	9,244	72%
Export revenues	949	665	1,531	61%	130%	na		2,196	1,597	38%
Export contribution	15%	8%	16%			na		12%	15%	
Gross Profit	2,106	2,513	3,244	54%	29%	na		5,757	3,419	68%
Gross Profit Margin	33%	30%	33%			na		32%	32%	
<b>EBITDA</b>	<b>1,668</b>	<b>1,907</b>	<b>2,487</b>	<b>49%</b>	<b>30%</b>	<b>2,497</b>	<b>0%</b>	<b>4,394</b>	<b>2,705</b>	<b>62%</b>
<b>EBITDA Margin (%)</b>	<b>25.8%</b>	<b>23.0%</b>	<b>25.5%</b>				<b>25.1%</b>	<b>24.3%</b>	<b>25.0%</b>	
PBT	2,367	2,174	3,988	68%	83%			6,162	3,738	65%
<b>Net Income</b>	<b>2,120</b>	<b>2,254</b>	<b>3,152</b>	<b>49%</b>	<b>40%</b>	<b>4,817</b>	<b>-35%</b>	<b>5,406</b>	<b>3,797</b>	<b>42%</b>
<b>Backlog (USDm)</b>	<b>7,900</b>	<b>8,200</b>	<b>8,400</b>	<b>6%</b>	<b>2%</b>	<b>na</b>		<b>8,400</b>	<b>7,900</b>	<b>6%</b>
<b>New contracts (USDm)</b>	<b>309</b>	<b>383</b>	<b>776</b>	<b>151%</b>	<b>103%</b>	<b>na</b>		<b>1,159</b>	<b>489</b>	<b>137%</b>
<b>Book-to-bill (x)</b>	<b>0.7</b>	<b>0.9</b>	<b>1.7</b>					<b>1.3</b>	<b>0.7</b>	
Net debt (TRY m)	6,222	6,394	13,857	123%	117%	na		13,857	6,222	123%

Source: WOOD Research, company data

## Estimates changes – we believe the street is too bearish

Post Aselsan's 1H23 results, we have updated our revenue and earnings estimates, using WOOD's economists' revised currency and inflation forecasts, and reflected our updated WACC and KPI assumptions to our valuation model. As the company's functional currency is the USD and the EUR (with 80% of its 1H23 backlog consisting of hard currency contracts), changes in our FX forecasts have an amplified impact on our TRY-based earnings estimates. Our revised average USD/TRY estimates for 2023E/24E, at 24.3 and 33.6, represent 23%/45% uplifts vs. our previous assumptions. We note that, with 60% of its cost base consisting of TRY-driven items, a weaker TRY is supportive for Aselsan's operating margins, as demonstrated by the company's EBITDA margin expansion from 19-22% in 2016-19 period to 24-27% in 2020-22 (when the TRY depreciated close to 70% against the USD).

In addition to the FX impact, the key driver of our upgraded revenue and earnings forecasts is our assumption that 2023 is an inflection point for the company's return to a USD-based backlog and revenue growth, with major geopolitical, technological and contract driven triggers boosting Aselsan's medium-term growth outlook (such as the USD 3.4bn of ytd orders secured in 8M23, which is already above the two-year cumulative contract inflows in FY21-22). We note that what we have seen in 2023, so far, may only be a prelude for several more contracts in Turkey and abroad, mainly in the core defence segment (but also in adjacent civilian markets, such as the company's recent entry into the promising wind turbine equipment production segment). For more details of Aselsan's near-term backlog addition prospects (in our view, the best indicator of the company's future revenue growth), please see a separate section of this report, titled "**A rich pipeline of potential contracts ahead**", on page 15. We note that we expect to see Aselsan report a record order book, possibly exceeding USD 10bn (underpinned by the company's post 1H23 sizeable contract wins), when it releases its 9M23 results in mid-October.

Following our model revisions, our 2023/24E year-end backlog assumptions are 33% and 50% higher in USD terms, at USD 9.3bn and USD 9.8bn, driven by more optimistic new contract inflow prospects, based on our 1.5x/1.2x book-to-bill ratio assumptions in 2023E/24E (previously 0.8x for both years). In USD terms, this translates into 12%/15% higher revenues estimates for 2023E/24E and 16%/19% higher EBITDA forecasts for the same period vs. our previous forecasts. Our NI estimates of USD 676m/685m are now 35%/22% higher than our earlier estimates. The TRY equivalent of our financial forecast changes is presented in the table below.

### Aselsan: estimates changes

	2022	2023E			2024E		
KPIs in USD:		New	Old	Change	New	Old	Change
<b>Backlog (USD m)</b>	<b>8,180</b>	<b>9,327</b>	<b>7,000</b>	<b>33%</b>	<b>9,750</b>	<b>6,500</b>	<b>50%</b>
Order inflows (USD m)	1,604	3,609	1,693	113%	3,130	1,846	70%
<b>Book-to-bill ratio (x)</b>	<b>0.8</b>	<b>1.5</b>	<b>0.8</b>		<b>1.2</b>	<b>0.8</b>	
<b>Revenues (USD m)</b>	<b>2,133</b>	<b>2,462</b>	<b>2,193</b>	<b>12%</b>	<b>2,708</b>	<b>2,346</b>	<b>15%</b>
<b>EBITDA (USD m)</b>	<b>573</b>	<b>612</b>	<b>529</b>	<b>16%</b>	<b>677</b>	<b>570</b>	<b>19%</b>
EBITDA margin	26.8%	24.9%	24.3%	0.6pp	25.0%	24.3%	0.7pp
<b>NI (USD m)</b>	<b>720</b>	<b>676</b>	<b>502</b>	<b>35%</b>	<b>685</b>	<b>561</b>	<b>22%</b>
<b>CAPEX** as % of sales</b>	<b>17.6%</b>	<b>16.9%</b>	<b>12.3%</b>	<b>4.6pp</b>	<b>11.4%</b>	<b>10.7%</b>	<b>0.7pp</b>
R&D spending* as % of sales	28.3%	28.0%	27.0%	1.0pp	27.5%	27.0%	0.5pp
<b>ND/EBITDA</b>	<b>0.5</b>	<b>0.6</b>	<b>0.8</b>		<b>0.6</b>	<b>0.7</b>	
<b>Avg. USD/TRY rate</b>	<b>16.5</b>	<b>24.3</b>	<b>19.8</b>	<b>23%</b>	<b>33.6</b>	<b>23.1</b>	<b>45%</b>
<b>TRY forecasts:</b>							
<b>Revenues (TRY m)</b>	<b>35,282</b>	<b>59,817</b>	<b>43,309</b>	<b>32%</b>	<b>90,981</b>	<b>54,201</b>	<b>68%</b>
<b>EBITDA (TRY m)</b>	<b>9,471</b>	<b>14,870</b>	<b>10,537</b>	<b>41%</b>	<b>22,753</b>	<b>13,151</b>	<b>73%</b>
EBITDA Margin	26.8%	24.9%	24.3%	0.6pp	25.0%	24.3%	0.7pp
<b>NI (TRY m)</b>	<b>11,916</b>	<b>16,422</b>	<b>9,916</b>	<b>66%</b>	<b>23,011</b>	<b>12,936</b>	<b>78%</b>
CAPEX**	6,203	10,085	5,333	75%	10,416	5,891	68%

Source: WOOD Research, company data; \*total capitalised and expensed R&D; \*\*net of disposals

Compared to the street's TRY-based earnings estimates, our numbers are significantly higher now: for 2023E, our revenue/EBITDA and NI estimates are 8-12% higher vs. the Bloomberg consensus (while our capex estimate of TRY 10.1bn is on a par with the consensus). For 2024E, our revenue and EBITDA/NI estimates are now 20-24% higher than the consensus; while, for 2025E, the difference is even larger, at 36-43%. Consequently, our revised 12M price target (PT) of TRY 56.4/share is 30% higher than the consensus PT of TRY 43.3.

In our view, the wide gap between our revised TRY earnings estimates and the street's numbers may be attributable to: i) a lower USD/TRY assumption by some analysts compared to our in-house forecasts; but also, ii) the possibly bearish stance of some brokers, following Aselsan's consecutive episode of backlog and top-line contraction (in USD terms) between December 2019 and December 2022. In our

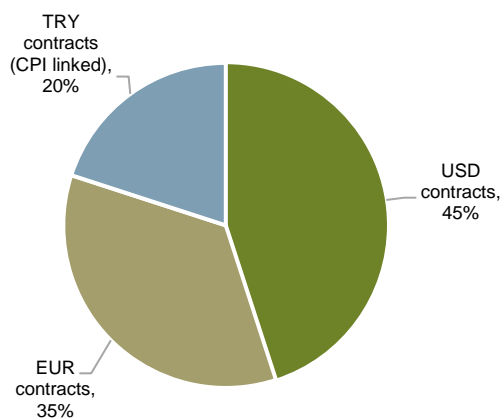
view, the consensus is yet to realise the significant improvement in the company's growth outlook, following global (changes in military procurement and defence budgets post the Ukraine war) and domestic developments (several mega defence projects reaching maturity or the serial production phase, new technologies acquired through persistent R&D and the Turkish defence sector's growing export footprint, especially in the APAC region).

#### Aselsan: earnings estimates and 12M PT – WOOD (E) vs. the consensus

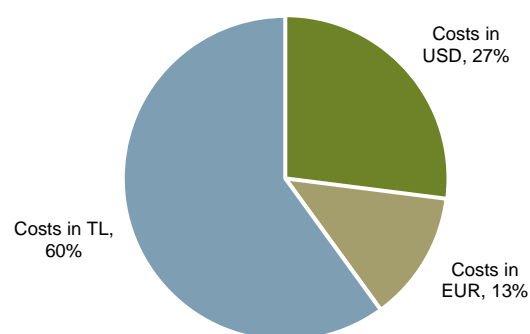
WOOD (E) in TRYm	2023E	2024E	2025E
<b>Revenues</b>	<b>59,817</b>	<b>90,981</b>	<b>132,768</b>
yoy growth	70%	52%	46%
<b>EBITDA</b>	<b>14,870</b>	<b>22,753</b>	<b>33,229</b>
EBITDA margin	24.9%	25.0%	25.0%
<b>NI</b>	<b>16,422</b>	<b>23,011</b>	<b>31,227</b>
NI margin	27.5%	25.3%	23.5%
<b>CAPEX</b>	<b>10,085</b>	<b>10,416</b>	<b>13,620</b>
CAPEX/Revenues	16.9%	11.4%	10.3%
Consensus (E) in TRYm	2023E	2024E	2025E
<b>Revenues</b>	<b>55,320</b>	<b>75,521</b>	<b>97,384</b>
yoy growth	57%	36%	29%
<b>EBITDA</b>	<b>14,022</b>	<b>18,763</b>	<b>23,265</b>
EBITDA margin	25.3%	24.8%	23.9%
<b>NI</b>	<b>14,678</b>	<b>18,518</b>	<b>23,784</b>
NI margin	26.5%	24.5%	24.4%
<b>CAPEX</b>	<b>9,993</b>	<b>10,968</b>	<b>11,304</b>
CAPEX/Revenues	18.1%	14.5%	11.6%
Wood vs consensus			
Sales	8%	20%	36%
EBITDA	6%	21%	43%
NI	12%	24%	31%
CAPEX	1%	-5%	20%
		<b>12M PT</b>	<b>Upside potential</b>
<b>Wood 12M PT</b>		<b>TRY 56.4/share</b>	<b>46%</b>
<b>Consensus 12M PT</b>		<b>TRY 43.3/share</b>	<b>12%</b>

Source: WOOD Research, Bloomberg

#### Aselsan: 1H23 backlog per contract currency



#### Aselsan: 1H23 costs base per currency mix



Source: WOOD Research, company data



## Key financial forecasts and KPI assumptions

As explained in earlier sections of this report, we expect Aselsan to return to a USD-based growth trajectory following a three-year period of backlog and revenue contraction. Historically, the company's USD top line growth has been closely linked with its book-to-bill trend (ratio of new contracts secured during a period over revenues generated during the same period) and, given the ongoing improvement in the company's book-to-bill ratio since the end of 2022 (1.3x in 1H23 vs. 0.7x in 1H22) and the cumulative size of the new contracts secured by Aselsan ytd in 2023 (as of the end of August at USD 3.4bn) exceeding the annual contract additions of the past four years (at USD 1.3-2bn), we expect 2023E to be an inflection point for the company's growth outlook. In our view, there are multiple tailwinds both in Turkey and at the global level, reinforcing the company's medium-term growth prospects.

### USD revenue KPI assumptions

KPIs	2020	2021	2022	2023E	2024E	2025E
<b>Year-end backlog (USD m)</b>	<b>9,500</b>	<b>8,500</b>	<b>8,180</b>	<b>9,327</b>	<b>9,750</b>	<b>10,000</b>
Avg. USD/TRY	7.0	8.9	16.5	24.3	33.6	45.4
<b>Backlog/LTM revenues (x)</b>	<b>4.1</b>	<b>3.8</b>	<b>3.8</b>	<b>3.8</b>	<b>3.6</b>	<b>3.4</b>
Order inflows during the year (USD m)	1,279	2,022	1,604	3,609	3,130	3,174
<b>Book-to-bill ratio</b>	<b>0.6</b>	<b>0.9</b>	<b>0.8</b>	<b>1.5</b>	<b>1.2</b>	<b>1.1</b>
Advances received at year-end /order inflows	38%	14%	16%	18%	20%	25%
<b>Revenues (USD m)</b>	<b>2,294</b>	<b>2,265</b>	<b>2,133</b>	<b>2,462</b>	<b>2,708</b>	<b>2,924</b>
<b>yoy growth</b>	<b>0%</b>	<b>-1%</b>	<b>-6%</b>	<b>15%</b>	<b>10%</b>	<b>8%</b>
Domestic revenues (USD m)	2,075	2,013	1,758	2,019	2,166	2,281
Revenue contribution (%)	90%	89%	82%	82%	80%	78%
Export revenues (USD m)	219	252	375	443	542	643
Revenue contribution (%)	10%	11%	18%	18%	20%	22%

Source: WOOD Research, company data

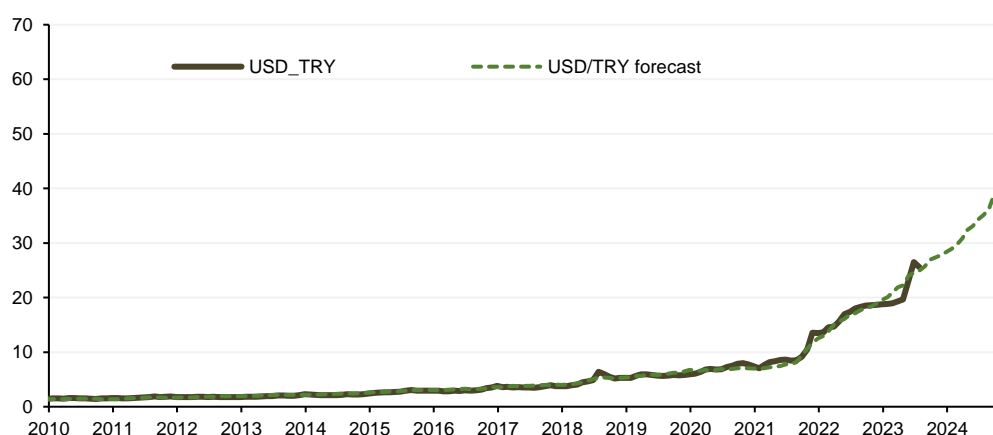
### To summarise:

- ✓ Following a temporary pause in 2021-22 (when Turkey's defence spending plunged to 1.9/1.2% of its GDP vs. 2.1-2.7% during 2017-20), we expect Turkish defence spending to recover to c.2% from 2023E-onwards and remain above this level in the medium term, as several large-scale domestic defence programmes reach the serial production phase (induction of new air defence missile systems, such as HISAR and SIPER, new radar and electronic warfare systems, such as HAVASOJ or KORAL-II, the accelerated construction of I-class frigates, and Reis class U214 submarines, the start of deliveries of the redesigned ALTAY tanks and several new UAV and precision guided munitions procurement projects). In the longer term, defence spending may be driven by the recently announced USD 2bn upgrade of the F16 fleet, the new F16 acquisitions, and the ongoing R&D work for the ATAK-2 helicopter and Kaan fighter jet programme.
- ✓ Secondly, with multiple conflicts at its borders and its close geography (the Ukraine war, the Syria civil war, the Azeri-Armenian conflict, and the PKK terror threat from Syria and Iraq), Turkey does not have the luxury to cut its defence spending, or stop its military modernisation and self-sufficiency efforts in the defence industry. In particular, self-sufficiency in critical defence technologies has been a bipartisan policy and strategic priority executed consistently (under the coordination of SSB) under various Turkish governments since the 1970s (with a major acceleration of the efforts from 2007-onwards). As Turkey's largest R&D spender and innovation centre for defence technologies, we believe that Aselsan will, inevitably, continue to benefit from this policy (together with client-funded R&D, the company spent USD 400-600m p.a. in 2018-22 for R&D, equivalent to 21-28% of its annual revenues).
- ✓ Thirdly, having reached considerable technological and manufacturing capability, to meet the requirements of its own military, the Turkish defence industry has been expanding its export footprint over the past couple of years, especially in the Eastern Europe, APAC and African markets (exporting anything from combat drones to attack helicopters, and light tanks to corvettes to countries like Kenya, the Philippines, UAE, Indonesia, Malaysia, Pakistan, Hungary, Romania and Ukraine). At the same time, despite the country's exclusion from the F35 industrial participation programme, several Turkish defence contractors are continuing to supply Western contractors, such as Pratt Whitney, Airbus, Lockheed and Sikorsky, with high-quality components and sub-systems. We believe that higher defence spending across NATO and the EU (due to the geopolitical paradigm shift created by the Ukraine war), and in the APAC region (due to the heightened threat perception from China), is a long-term trend that will not fade away over the next few years. This is supportive for Turkish defence contractors' export prospects, given the industry's high production qualities (on NATO standards) and cost competencies (R&D and manufacturing costs), offering more affordable, but combat-proven

alternatives to countries with budgetary issues. We also believe that the long waiting lists and capacity bottlenecks of some Western defence peers may prove to be a competitive advantage for defence suppliers in countries like Israel, Turkey and South Korea in export markets. It should be noted that Aselsan's export revenues are driven not only by its own export activities or its small portfolio of international subsidiaries and JVs (in UAE, Ukraine, Kazakhstan, Malaysia, Qatar and some other countries), but also through the reexports of the systems and sensors, products integrated to platforms exported by other Turkish defence contactors, such as Turkish Aerospace, BMC, Otokar, Baykar and shipyards.

- ✓ In addition to these factors, we also see the appointment of former Aselsan CEO, Professor Haluk Gorgün, to the Head of defence procurement agency SSB in June, as a positive development for the company's chances to improve its customer advance collections from its main client (thus repairing Aselsan's deteriorated working capital dynamics, since 2018). Finally, the hard currency denominated nature of Aselsan's backlog vs. its mainly TRY-driven cost base and rising share of higher value added systems in the revenue mix should help the company maintain its EBITDA margin at 24-26% (one of the highest among its international peers) going forward. We note that our macroeconomic team expects the TRY depreciation against the USD (and the EUR) to continue at a decelerated pace (compared to the 2021-1H23 period) and the USD/TRY exchange rate reaching 40.7 by the end of 2024E.

### WOOD's USD/TRY model



Source: CEIC, ADA Economics in association with WOOD Research

We summarise our key forecast assumptions below:

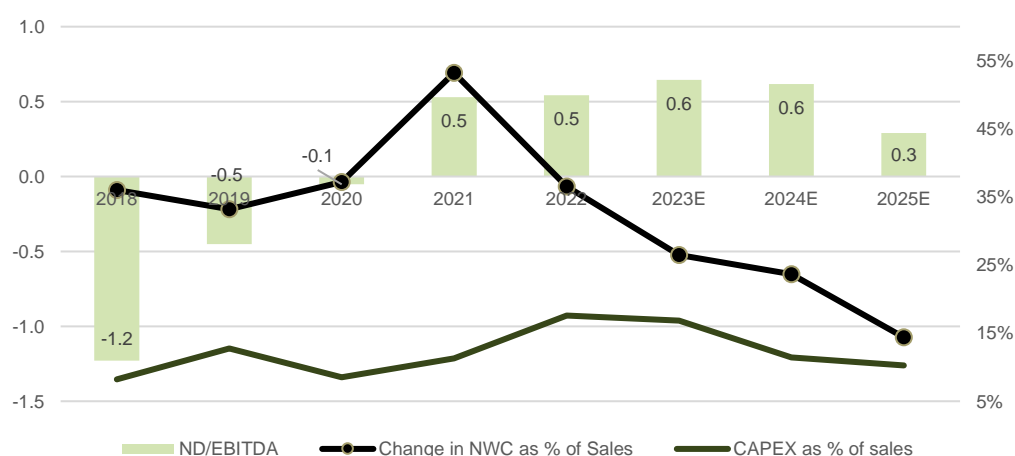
**Top-line growth:** in USD terms, we forecast Aselsan to post 15% and 10% top-line growth in 2023-24E, 8% in 2025E, and 5% beyond. We note that the company delivered 24% revenue growth in 1H23 and, during periods of previous defence spending upcycles, had consecutive years of double-digit revenue growth in USD terms. For instance, between 2016-19, the company's revenues soared from USD 1.25bn to USD 2.3bn, representing a revenue CAGR of 16% in USD terms (during this period, Aselsan's backlog surged from USD 6.2bn to USD 9.7bn). Moreover, unlike in the late-2010s, the company is at a higher technological maturity now, with higher value added systems, such as state-of-the-art EW or radar systems. The lifting of selective defence technology restrictions imposed previously on Turkey by some of its NATO allies in 2019-20 should also help the company to focus on higher priority R&D areas and spend less money and engineering time on localising any lower technology components that can be imported from foreign suppliers. We note that, although these open and hidden embargoes necessitated the localisation of more than 700 critical components by Aselsan and urged its local peers to develop alternative solutions, we believe that they have also caused significant delays in some major national projects, such as the ALTAY tank programme. Finally, it should be noted that, even before the recent USD 2.4bn additions in the July-August period, Aselsan's order book of USD 8.4bn provides the company with close to four years of revenue visibility (based on the FY22 revenues of USD 2.1bn).

- ✓ **Operating margins:** Aselsan remains a net FX earner and a beneficiary of TRY depreciation. As of 1H23, 45% of its backlog consists of domestic and export contracts denominated in USD, 35% in EUR (and the remaining 20% in CPI-linked TRY contracts), whereas 60% of its cost base consists of TRY-based cost items. Hence, the company should continue to benefit from a weakening TRY trend (our macro team forecasts the USD/TRY to reach 30-31 by the 2023E year-end and surpass 40 by end-2024E). On another note, the project mix of the existing order book should be another determinant of Aselsan's gross and EBITDA margins,

in our view. Considering the potentially lower export margins initially and the rising contribution of exports (from 16% in 2022 to 25% by 2025E and beyond, we conservatively forecast Aselsan's EBITDA margins in a narrow 24.9-25.1% range (vs. 27.3%/26.8% in FY21/22) in 2023-33E.

- ✓ **Capex and R&D spending:** Aselsan's capex spending has, historically, been driven by tangible equipment, technology and production capacity, facility construction investments and the capitalised part of its R&D spending (intangible capex). Between 2018-22, capex/sales ratio fluctuated between 8.2% and 17.6% (a peak in 2022), while the FY23E management guidance of TRY 10bn implies roughly 17% of our revenue forecast. Considering the high capex trend in the past two years (and its historically cyclical nature) and given no major facility investments on the horizon, we expect Aselsan's capex/sales ratio to ease to 11%/10% in 2024E/25E, from a high 17% in 2023E and continue at a normalised 8% of revenues beyond 2025E. We forecast no major changes in the company's R&D trends (total R&D spending elevated to 28% in 2021-22 from a lower 21-24% in 2018-20) and project Aselsan's R&D spending to remain at 27-28% in 2023-25E and 26% beyond 2025E.
- ✓ **Net debt trends:** having carried a cash position prior to 2021, Aselsan closed 2021 and 2022 with a net debt position equivalent to 0.5x of its annual EBITDA in those years. More recently, due to the temporary slowdown of bureaucratic processes ahead of the May 2023 elections in Turkey, the company's ND level reached 1.1x of its LTM EBITDA. Apart from elevated (but cyclical) capex levels, a key driver of this trend is the constant deterioration in Aselsan's advance collections from its main client SSB in the past three years, despite the company's obligation to keep supporting its local suppliers (including thousands of SMEs) with advances (especially during the supply disruptions created by the 2020-21 COVID-19 pandemic). Going forward, considering the very recent management change at SSB (which, for the first time in its history, has been led by a former Aselsan CEO, since June 2023), accounting for 50% of Aselsan's 1H23 backlog, we expect an improvement in Aselsan's advance collections from its main client (in terms of both timeliness and magnitude). Coupled with our assumptions of gradually normalising capex levels (after 2023) and accelerating revenue/EBITDA growth, we expect Aselsan's ND/EBITDA levels to stay stable yoy, at 0.6x by the 2023E/24E year-ends, before declining to 0.3x as at end-2025E and switching eventually to a net cash position from 2026E-onwards. We also note that, due to its predominantly hard currency order book, Aselsan has a structurally long balance sheet FX position (as of 1H23, equivalent to USD 596m), which generates net FX gains, helping the company to alleviate the impact of higher financing expenses due to elevated indebtedness.

#### Aselsan: NWC and capex trends vs. ND (cash)/EBITDA progression, 2018-25E



Source: WOOD Research, company data

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- ✓ **Effective tax rate:** as Turkey's largest R&D spender, the company continues to benefit fully from the corporate tax shield provided by its R&D activities (according to Turkish tax legislation, all R&D spending, whether equity of client funded, is 100% tax deductible and any unused R&D tax benefits can be carried forward indefinitely). Hence, despite the TRY 1.2bn one-off earthquake tax levied on the company in 1H23, we expect Aselsan not to pay any corporate tax, but to incur deferred tax income at a pace of 3% of PBT beyond 2023E (vs. an average of 6% in 2017-22). We have intentionally kept our deferred tax income forecast conservative, as this is an item driven by Aselsan's statutory tax accounts (which makes the task of forecasting this item very difficult).
  - ✓ **NI and net margins:** our revised financial forecasts, discussed above, result in TRY 16.4bn and TRY 23bn in net earnings estimates for 2023E-24E, respectively, and TRY 31.2bn for 2025E. Due to our more conservative deferred tax income estimates and the impact of higher net financial charges, this suggests a lower net margin range of 27.5-23.5% in 2023-25E vs. 28-35% in 2020-22.

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## Valuation – our revised estimates imply a TRY 56.4/share PT

Our valuation approach for Aselsan's fair value estimation remains the same: we use a blended valuation methodology to set our price target (PT) for Aselsan, assigning a 60% weight to our 10-year DCF metric and a 40% weight to the target forward-year (2024E) multiples, set at a c.35% discount to the company's EM and DM defence electronics peers, trading currently at 12.2x EV/EBITDA and 17.9x P/E on the 2024E consensus earnings (we set our target 2024E multiples at 8.5x EV/EBITDA and 11x P/E).

Although +80% of Aselsan's backlog (and, hence, its revenue stream) has always been USD and EUR driven (Aselsan's functional currencies), the company's reporting currency is the TRY; hence, our earnings estimates and WACC assumptions are also TRY based. Considering that the benchmark long-term TRY bond yield (at 19.3% currently, but fluctuating between 8-29% since early-2022) is volatile and distorted by banking regulations (lenders forced to buy government bonds and deposit them with the CBRT if certain loan or deposit metrics are not met), we do not use the benchmark TRY bond yields for our risk-free rate (RFR) calculation for our Turkish coverage universe. Instead, we depend on a synthetic RFR approach, taking into account Turkey's USD-based Eurobond yields, the CDS spreads and the Turkish and US inflation outlooks, based on data from Bloomberg, as well as the CBT's inflation surveys. This synthetic model predicts RFRs of 43% in 2023E, 30% in 2024E, and 21.5% thereafter. For the terminal growth rate, we use a real 5% (and a nominal 13%) in TRY terms. After adding the 1H23 net debt, the independent appraisal value of the company's 15% stake in Roketsan, and the book value of Aselsan's unconsolidated JVs and landbank (as of 4Q22), we reach a blended equity valuation of TRY 186bn, implying a 12M PT of TRY 56.4/share, suggesting 46% upside vs. the current share price.

We note that, in this report, we also take into account:

- ✓ The company's recently approved (by the CMB, 15 August) 100% bonus share issue, increasing the number of shares issued to 4,560m, from 2,280m (the stock split became effective as of 25 August, when the BIST stock price was adjusted). Obviously, this has no impact on the company's market capitalisation, our valuation or earnings estimates, but the changes per share based metrics, such as EPS and DPS, due to the higher number of issued shares.
- ✓ Starting with this report, we stop using the additional 15% special discount factor in our Aselsan valuation. This was first introduced in our Aselsan report dated 27 November 2019, to reflect the geopolitical risks, such as the indirect impact of the selective CAATSA sanctions imposed on the top management of Turkish defence procurement agency, SSB (Aselsan's main client), due to the SSB's decision to acquire S400 air defence systems from Russia and the defence-related export restrictions imposed by some of Turkey's NATO allies, following Turkey's cross-border operations in Syria against the PKK terror organisation, as well as the Assad regime. Considering the recent improvement of Turkey's relationships with some of its NATO members and the Biden administration over the past year (when, for instance, the UK, the Netherlands, Finland and Sweden removed their restrictions on defence sector related exports targeting Turkey), the implications of the Ukraine war for Turkey's role in NATO, as well as the NATO expansion, we believe that such a discount factor is not justified any longer.

On our revised 2024E numbers, the stock is trading currently at an undemanding 8.4x EV/EBITDA and 7.7x P/E, placing Aselsan at 31-57% discounts vs. its international defence electronics peers, trading at medians of 12.2x and 17.9x, respectively, on the Bloomberg 2024E consensus. We note that the wider global defence and aerospace peers trade at a median of 11.7x EV/EBITDA and 16.1x P/E, on the Bloomberg 2024E consensus estimates (for the details of the global peer universe used in our multiples based valuation, please refer to the table below). Considering the recent improvement in Aselsan's risk/reward profile, such as the sizeable additions to its backlog (supportive for the company's long-term growth outlook), that the company has one of the highest EV/revenue cover ratios (adjusted for the recent contracts, Aselsan's order book is now equivalent to +4 years of revenues) and operates with one of the highest EBITDA margins among its defence electronics peers, we believe that a re-rating of the stock is well justified.

Although we have not included it in our Aselsan equity valuation methodology, we have also compared Aselsan vs. its selected global peers using an EV/backlog metric (where the backlog data are available and regularly disclosed). We believe that this is a useful valuation tool for comparing aerospace and defence sector stocks vis à vis their current backlog levels (in our view, the backlog is one of the most important leading indicators of future sales and earnings growth for a defence contractor). We believe that, given the unprecedented growth in global defence companies' order book levels post the Ukraine war, this metric is even more relevant for comparative valuation purposes. Accordingly, in our EV/backlog analysis, we have included (in addition to Aselsan) seven European peers (Thales, Hensoldt, Qinetiq, BAE Systems, Leonardo, Kongsberg and Saab), four Asian peers (Elbit Systems, Bharat Electronics, Lig Nex1 and Singapore Technologies) and three American peers (Raytheon, L3Harris and Leonardo

DRS). These companies trade currently in a range of 0.17-1.74x of their 1H23 backlogs, implying an average of 0.79x. Compared to this universe, Aselsan is trading at a 0.63x EV/1H23 backlog adjusted for c.USD2.3bn of new contracts added to the company's backlog since the end of 1H23.

### Selected global defence and aerospace peer multiples

Company	Map (USD m)	Country	EV/EBITDA 23E	EV/EBITDA 24E	P/E 23E	P/E 24E
Aselsan**	6,565	Turkey	12.5	8.4	10.8	7.7
Otokar	1,594	Turkey	18.1	11.9	21.5	13.4
Bharat Electronics**	12,299	India	20.7	17.9	29.7	25.4
Hindustan Aeronautics	15,920	India	15.6	14.0	25.4	22.7
Elbit System**	8,764	Israel	16.9	15.5	28.8	25.3
Hanwha Systems**	1,981	South Korea	13.9	12.2	10.9	37.3
LIG NEX1**	1,366	South Korea	7.5	6.0	11.8	9.0
Korea Aerospace	3,501	South Korea	11.2	9.9	20.8	19.9
Singapore Tech Engineering**	8,806	Singapore	12.9	13.0	20.3	19.2
Avichina	3,611	China	5.6	4.9	9.9	8.4
China Avionics**	9,983	China	26.9	22.5	25.6	24.5
Hensholdt**	3,418	Germany	11.5	10.2	19.9	16.4
Garmin**	19,470	US	13.9	12.9	19.6	18.1
Leonardo DRS **	4,564	US/Israel	15.5	13.2	26.3	21.7
L3Harris Technologies **	33,525	US	12.7	11.7	14.4	13.2
Leidos Holdings**	13,336	US	11.6	10.9	14.6	13.2
Raytheon Technologies**	125,581	US	13.3	12.1	17.2	15.5
Thales**	31,075	France	10.2	9.3	17.5	15.8
Qinetiq**	2,250	UK	7.3	6.7	11.0	10.1
Saab**	7,182	Sweden	11.8	10.4	25.3	20.9
Kongsberg Gruppen**	7,450	Norway	14.6	13.0	23.0	20.1
Chemring	1,103	UK	10.0	9.3	15.8	14.9
BAE Systems**	37,650	UK	10.2	9.7	15.8	14.5
General Dynamics**	61,164	US	13.1	11.6	17.7	15.0
Northrop Grumman	66,617	US	14.2	13.3	19.1	17.6
Leonardo Spa**	8,117	Italy	6.5	6.0	10.3	9.0
Rheinmetall AG	11,699	Germany	9.5	7.8	21.5	13.4
<b>Defence&amp;Aero sector peers median*</b>			<b>12.8</b>	<b>11.7</b>	<b>19.4</b>	<b>16.1</b>
<b>Defence electronics peers median*</b>			<b>13.1</b>	<b>12.2</b>	<b>19.4</b>	<b>17.9</b>

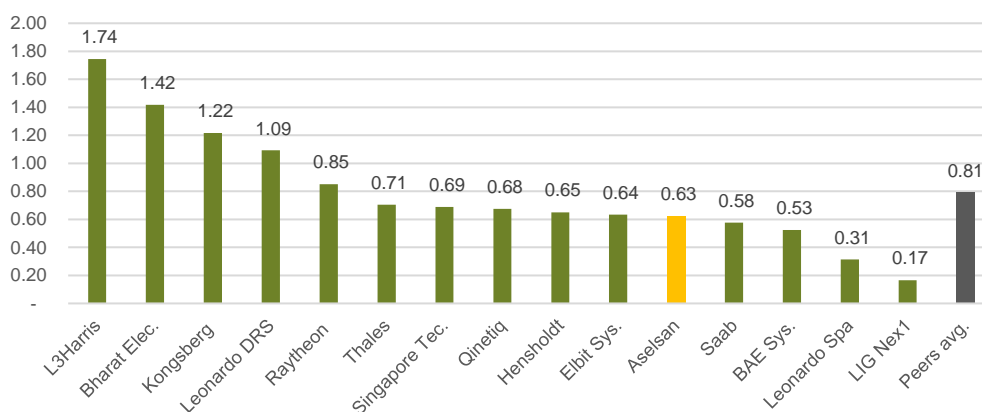
Source: WOOD Research, Bloomberg consensus multiples except Aselsan; \*ex-Aselsan; \*\*peers, where defence electronics is a major area of activity

### Aselsan: valuation methodology

Metric	Implied equity value (TRY m)	Weight
DCF core value	156,739	60%
11x target 2024E P/E set at 35% discount to global peers	253,124	20%
8.5x target 2024E EV/EBITDA set at 35% discount to global peers	179,545	20%
<b>Blended core business equity value</b>	<b>180,577</b>	
15% Roketsan stake*	4,259	
Book value of JVs and land bank*	1,098	
<b>Total fair value</b>	<b>185,935</b>	
<b>2023E/24E TRY WACC</b>	<b>38.3%</b>	
<b>No of shares outstanding</b>	<b>4,560m</b>	
<b>12M PT</b>	<b>TRY 56.40</b>	
<b>Current price</b>	<b>TRY 38.56</b>	
<b>Upside potential</b>	<b>46%</b>	

Source: WOOD Research; \*independent appraisal value and BV as of 4Q22

## Selected defence electronics peers: EV/1H23 backlog (x)



Source: WOOD Research, Bloomberg, IR disclosures; Aselsan 1H23 backlog adjusted for USD 2.1bn contracts secured in July

## Aselsan: DCF valuation

	2022	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
<b>Revenues (in USDm)</b>	2,133	2,462	2,708	2,924	3,082	3,249	3,424	3,609	3,804	4,009	4,226	4,454
<b>Yoy growth (in USD)</b>	-6%	15%	10%	8%	5%	5%	5%	5%	5%	5%	5%	5%
Avg. USD/TRY rate	16.5	24.3	33.6	45.4	54.6	63.3	71.9	80.0	87.3	94.3	101.9	107.9
<b>TRYm forecasts :</b>												
Revenue	35,282	59,817	90,981	132,768	168,294	205,484	246,028	288,728	332,088	378,199	430,511	480,582
Yoy growth %	75%	70%	52%	46%	27%	22%	20%	17%	15%	14%	14%	12%
EBITDA	9,471	14,870	22,753	33,229	42,294	51,630	61,895	72,619	83,320	94,550	107,628	120,145
<b>EBITDA Margin</b>	<b>26.8%</b>	24.9%	25.0%	25.0%	25.1%	25.1%	25.2%	25.2%	25.1%	25.0%	25.0%	25.0%
EBIT	8,884	13,937	21,017	30,669	38,708	46,850	55,848	65,195	74,424	84,758	96,482	107,703
Tax on EBIT*	0	0	0	0	0	0	0	0	0	0	0	0
<b>NOPAT</b>	<b>8,884</b>	<b>13,937</b>	<b>21,017</b>	<b>30,669</b>	<b>38,708</b>	<b>46,850</b>	<b>55,848</b>	<b>65,195</b>	<b>74,424</b>	<b>84,758</b>	<b>96,482</b>	<b>107,703</b>
D&A charge	587	933	1,736	2,560	3,586	4,779	6,047	7,424	8,896	9,792	11,146	12,442
<b>CAPEX and cap. R&amp;D</b>	<b>6,203</b>	<b>10,085</b>	<b>10,416</b>	<b>13,620</b>	<b>16,380</b>	<b>18,343</b>	<b>20,837</b>	<b>23,200</b>	<b>27,063</b>	<b>30,256</b>	<b>34,441</b>	<b>38,447</b>
CAPEX (% of revenues)	18%	17%	11%	10%	10%	9%	8%	8%	8%	8%	8%	8%
Chg. in core work. cap.	-9,418	-5,896	-7,301	-3,549	-11,351	-9,613	-10,480	-11,038	-11,208	-11,346	-12,915	-14,417
<b>FCF</b>	<b>-6,150</b>	<b>-1,110</b>	<b>5,036</b>	<b>16,060</b>	<b>14,563</b>	<b>23,674</b>	<b>30,578</b>	<b>38,382</b>	<b>45,048</b>	<b>52,948</b>	<b>60,272</b>	<b>67,281</b>
TRY WACC	nm	44.3%	32.2%	24.1%	24.1%	24.1%	24.1%	24.1%	24.1%	24.1%	24.1%	24.1%
PV of FCF (2H23-2033E)	88,006											
PV of Terminal Value	82,588											
<b>Core enterprise value</b>	<b>170,595</b>											
Net debt 1H23	-13,856											
<b>Core DCF Equity Value</b>	<b>156,739</b>											
15% stake in Roketsan**	4,259											
BV of JV and land for sale	1,098											
<b>Total enterprise value</b>	<b>162,096</b>											

Source: WOOD Research, company data; \*we assume Aselsan remains tax exempt, due to its R&D tax shields; \*\*4Q22 independent appraisal value

## Aselsan: TRY WACC calculation

	2023E	2024E	2025-32E
Weight of debt %	20%	20%	20%
Weigh of equity %	80%	80%	80%
Cost of debt (after tax)	33.4%	25.2%	18.4%
<b>Risk free rate</b>	<b>43.0%</b>	<b>30.0%</b>	<b>21.5%</b>
Beta	0.8	0.8	0.8
Equity Risk Premium	5.0%	5.0%	5.0%
Cost of Equity	47.0%	34.0%	25.5%
<b>WACC</b>	<b>44.3%</b>	<b>32.2%</b>	<b>24.1%</b>

Source: WOOD Research

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## Risks

- ✓ Execution risks, such as supply disruptions, a longer-than-anticipated R&D phase, delaying project progress rates (leading to lower revenue growth).
- ✓ Disruptive technologies, rendering Aselsan's existing products obsolete or triggering additional R&D.
- ✓ Talent retention risk related to R&D and engineering personnel (due to more attractive employment opportunities in other sectors or countries).
- ✓ Foreign embargoes and supply restrictions on critical materials such as micro-chips, critical components causing delays or product redesign (due to localisation needs).
- ✓ Any changes in R&D tax legislation removing Aselsan's *de-facto* long-term corporate tax exemption.
- ✓ Potential change in SSB's (Aselsan's largest customer) contract currencies in favour of the TRY, exposing the company to currency risk (currently, Aselsan's domestic contracts are predominantly USD or EUR denominated).
- ✓ Elevated working capital needs, if there is no improvement in the timely payment of contract advances by the SSB.
- ✓ High dependence on the Turkish defence budget and military procurement (85% of the FY22 revenues were generated by domestic activities, while 87% of the 1H23 backlog consisted of contracts from Turkish customers). This exposes the company to Turkey-related macro and political risks.



# Financials

## Balance sheet

TRY m	2020	2021	2022	2023E	2024E	2025E
<b>Current Assets</b>	<b>19,589</b>	<b>23,175</b>	<b>38,297</b>	<b>67,127</b>	<b>91,611</b>	<b>135,720</b>
Cash	4,078	2,491	5,685	11,332	13,122	25,692
Trade receivables	7,147	9,803	14,888	24,582	33,651	49,106
Inventory	5,533	7,639	12,592	20,862	29,531	39,401
Advances given	1,546	1,689	2,711	6,491	9,416	13,290
Others	1,286	1,553	2,421	3,860	5,891	8,231
<b>Non-Current Assets</b>	<b>14,505</b>	<b>23,238</b>	<b>37,745</b>	<b>62,057</b>	<b>90,966</b>	<b>125,770</b>
Trade receivables	7,469	12,650	18,974	28,952	41,834	57,995
Financial investments	1,183	2,149	4,288	6,518	9,975	13,432
Net, property plant equipment	2,342	3,432	6,327	12,944	18,706	25,886
Net, Intangible assets	1,555	2,268	3,531	6,066	8,983	12,863
Advances given	342	795	707	1,623	2,354	3,323
Accrued liabilities and others	1,614	1,944	3,918	5,955	9,114	12,271
<b>Total Assets</b>	<b>34,094</b>	<b>46,413</b>	<b>76,042</b>	<b>129,184</b>	<b>182,577</b>	<b>261,491</b>
<b>Current Liabilities</b>	<b>12,320</b>	<b>16,750</b>	<b>29,651</b>	<b>54,886</b>	<b>78,856</b>	<b>114,362</b>
Short term debt	3,007	5,070	9,763	16,822	22,030	28,840
Trade payables	4,251	6,039	9,775	16,470	25,313	36,938
Order advances received	1,779	611	2,160	7,898	10,525	18,027
Accrued liabilities and others	3,283	5,030	7,953	13,695	20,988	30,557
<b>Non-current Liabilities</b>	<b>3,676</b>	<b>3,828</b>	<b>6,531</b>	<b>17,452</b>	<b>24,116</b>	<b>36,764</b>
Long term debt	883	333	1,069	4,094	5,136	6,498
Order advances received	1,636	1,929	2,157	7,887	10,511	18,002
Others	1,157	1,566	3,305	5,471	8,469	12,264
<b>Equity</b>	<b>18,098</b>	<b>25,835</b>	<b>39,861</b>	<b>56,846</b>	<b>79,605</b>	<b>110,365</b>
Paid-in capital	2,280	2,280	2,280	2,280	2,280	2,280
Net profit for the period	4,449	7,131	11,916	16,422	23,011	31,227
Reserves and others	11,153	16,152	25,441	37,835	53,881	76,270
Minority interest	216	272	224	309	433	587
<b>Total liabilities and equity</b>	<b>34,094</b>	<b>46,413</b>	<b>76,042</b>	<b>129,184</b>	<b>182,577</b>	<b>261,491</b>

Source: WOOD Research, company data

## Cash flow statement

TRY m	2020	2021	2022	2023E	2024E	2025E
<b>NI attributable to group</b>	<b>4,449</b>	<b>7,139</b>	<b>11,916</b>	<b>16,422</b>	<b>23,011</b>	<b>31,227</b>
<b>Adjust. to reconcile NI to net cash provided by operations:</b>	<b>3,477</b>	<b>6,098</b>	<b>6,784</b>	<b>6,468</b>	<b>9,855</b>	<b>13,189</b>
D&A	286	432	587	933	1,736	2,560
Others	3,192	5,666	6,197	5,535	8,119	10,629
<b>Changes in working capital</b>	<b>-5,989</b>	<b>-10,717</b>	<b>-12,891</b>	<b>-15,838</b>	<b>-21,538</b>	<b>-19,096</b>
Taxes paid	-13	6	-4	1,155*	0	0
<b>Cash flow from operating activities</b>	<b>1,925</b>	<b>2,526</b>	<b>5,804</b>	<b>8,207</b>	<b>11,329</b>	<b>25,321</b>
<b>Cash flows from investing activities:</b>	<b>-2,001</b>	<b>-3,534</b>	<b>-5,791</b>	<b>-12,093</b>	<b>-13,318</b>	<b>-17,636</b>
Capex inc. capitalized R&D	-1,375	-2,263	-4,809	-10,085	-10,416	-13,620
Others (Revaluation of PPE, change in financial investments)	-626	-1,271	-982	-2,008	-2,902	-4,016
<b>Cash flows from financing activities:</b>	<b>641</b>	<b>-578</b>	<b>3,181</b>	<b>9,532</b>	<b>3,779</b>	<b>4,885</b>
Change in debt	995	-650	3,525	10,085	6,250	8,172
Dividends paid	-252	-103	-153	-400	-1,640	-2,298
Proceeds from capital increase, FX and interest items	-102	175	-191	-152	-831	-988
<b>Net cash flows generated</b>	<b>565</b>	<b>-1,587</b>	<b>3,194</b>	<b>5,647</b>	<b>1,790</b>	<b>12,570</b>
Cash position at beginning of the year	3,513	4,078	2,491	5,685	11,332	13,122
<b>Cash position at the end of the year</b>	<b>4,078</b>	<b>2,491</b>	<b>5,685</b>	<b>11,332</b>	<b>13,122</b>	<b>25,692</b>
<b>Net debt /(cash)</b>	<b>-205</b>	<b>2,912</b>	<b>5,147</b>	<b>9,584</b>	<b>14,044</b>	<b>9,646</b>
<b>ND/EBITDA</b>	<b>-0.1</b>	<b>0.5</b>	<b>0.5</b>	<b>0.6</b>	<b>0.6</b>	<b>0.3</b>

Source: WOOD Research, company data; \*one of the disaster taxes levied following February 2023 Kahramanmaraş earthquake in Turkey

## Income statement

TRY m	2020	2021	2022	2023E	2024E	2025E
<b>Revenues in US\$ m</b>	<b>\$2,294</b>	<b>\$2,265</b>	<b>\$2,133</b>	<b>2,462</b>	<b>2,708</b>	<b>2,924</b>
<b>yoy % in US\$ terms</b>	<b>0%</b>	<b>-1%</b>	<b>-6%</b>	<b>15%</b>	<b>10%</b>	<b>8%</b>
Avg. USD/TRY	7.0	8.9	16.5	24.3	33.6	45.4
<b>Revenues</b>	<b>16,104</b>	<b>20,139</b>	<b>35,282</b>	<b>59,817</b>	<b>90,981</b>	<b>132,768</b>
<b>yoy % in TL terms</b>	<b>24%</b>	<b>25%</b>	<b>75%</b>	<b>70%</b>	<b>52%</b>	<b>46%</b>
Domestic sales	14,564	17,896	29,085	49,050	72,785	103,559
yoy domestic growth	27%	23%	63%	69%	49%	42%
Exports (TRY m)	1,540	2,243	6,197	10,767	18,196	29,209
yoy exports growth	-2%	46%	176%	74%	69%	61%
Export contribution(%)	10%	11%	18%	18%	20%	22%
<b>Cost of revenues</b>	<b>-11,499</b>	<b>-13,490</b>	<b>-23,498</b>	<b>-40,077</b>	<b>-61,594</b>	<b>-89,884</b>
<b>Gross profit</b>	<b>4,605</b>	<b>6,649</b>	<b>11,783</b>	<b>19,740</b>	<b>29,387</b>	<b>42,884</b>
<b>Gross margin</b>	<b>28.6%</b>	<b>33.0%</b>	<b>33.4%</b>	<b>33.0%</b>	<b>32.3%</b>	<b>32.3%</b>
Sales and marketing expenses	-281	-670	-878	-1,615	-2,456	-3,585
General administrative expenses	-400	-576	-1,206	-2,692	-3,639	-5,311
R&D expenses (directly expensed R&D)	-283	-333	-816	-1,495	-2,275	-3,319
<b>EBIT</b>	<b>3,642</b>	<b>5,070</b>	<b>8,884</b>	<b>13,937</b>	<b>21,017</b>	<b>30,669</b>
<b>EBIT margin</b>	<b>22.6%</b>	<b>25.2%</b>	<b>25.2%</b>	<b>23.3%</b>	<b>23.1%</b>	<b>23.1%</b>
Non-operating income (exc. FX gain/loss)	-50	-139	-65	-652	-992	-1,447
<b>Operating Income</b>	<b>3,592</b>	<b>4,931</b>	<b>8,819</b>	<b>13,285</b>	<b>20,025</b>	<b>29,222</b>
<b>EBITDA</b>	<b>3,927</b>	<b>5,502</b>	<b>9,471</b>	<b>14,870</b>	<b>22,753</b>	<b>33,229</b>
<b>EBITDA margin</b>	<b>24.4%</b>	<b>27.3%</b>	<b>26.8%</b>	<b>24.9%</b>	<b>25.0%</b>	<b>25.0%</b>
D&A	286	432	587	933	1,736	2,560
Financial income	728	228	125	1,127	1,497	1,738
Financial expense	-475	-294	-576	-1,579	-2,658	-3,083
Fx gain/loss (operating and financial)	1,020	2,330	1,506	3,851	3,392	2,326
Income from subsidiaries	20	10	25	38	57	77
<b>PBT</b>	<b>4,885</b>	<b>7,204</b>	<b>9,899</b>	<b>16,721</b>	<b>22,314</b>	<b>30,281</b>
Tax charge for the period	5	2	2	1,155	0	0
Deferred tax income (expense)	-419	-67	1,971	836	669	908
<b>Net profit for the period</b>	<b>4,461</b>	<b>7,135</b>	<b>11,868</b>	<b>16,402</b>	<b>22,983</b>	<b>31,189</b>
Minority interest	12	-3	-48	-20	-28	-38
<b>Net profit attributable to the group</b>	<b>4,449</b>	<b>7,139</b>	<b>11,916</b>	<b>16,422</b>	<b>23,011</b>	<b>31,227</b>
<b>Net margin</b>	<b>28%</b>	<b>35%</b>	<b>34%</b>	<b>27.5%</b>	<b>25.3%</b>	<b>23.5%</b>

Source: WOOD Research, company data

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26/08/2022	HOLD	26/08/2022	TRY 27.46
		25/28/2023	TRY 13.75
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## CONTACTS

### Czech Republic

namesti Republiky 1079/1a  
Palladium  
110 00 Praha 1  
Czech Republic  
Tel +420 222 096 111  
Fax +420 222 096 222

### Poland

Centrum Marszalkowska  
Marszalkowska 126/134  
7<sup>th</sup> Floor  
00 008 Warszawa  
Poland  
Tel +48 22 222 1530  
Fax +48 22 222 1531

### UK

16 Berkeley Street  
London  
W1J 8DZ  
Tel +44 20 3530 0691

### Italy

Via Luigi Settembrini, 35  
20124 Milan  
Italy  
Tel +39 02 36692 500

Bloomberg page  
WUCO

[www.wood.com](http://www.wood.com)

### Romania

Lamda Building  
7A Bucuresti-Ploiesti Street  
4<sup>th</sup> Floor  
013682 Bucharest 1  
Tel.: +40 316 30 11 81

## Research

### Co-Head of Equities/ Head of Research

**Marta Jezewska-Wasilewska**  
+48 22 222 1548  
[marta.jezewska-wasilewska@wood.com](mailto:marta.jezewska-wasilewska@wood.com)

### Head of Consumer/Industrials

**Lukasz Wachelko**  
+48 22 222 1560  
[lukasz.wachelko@wood.com](mailto:lukasz.wachelko@wood.com)

### Macroeconomics

**Raffaella Tenconi**  
+44 20 3530 0685  
[raffaella.tenconi@wood.com](mailto:raffaella.tenconi@wood.com)

### Head of Turkey Research

**Atinc Ozkan**  
+90 542 202 3632  
[atinc.ozkan@wood.com](mailto:atinc.ozkan@wood.com)

### Head of Romania Research

**Iuliana Ciopraga**  
+40 316 30 1185  
[iuliana.ciopraga@wood.com](mailto:iuliana.ciopraga@wood.com)

### Head of Financials

**Can Demir**  
+44 20 3530 0623  
[can.demir@wood.com](mailto:can.demir@wood.com)

### Head of TMT

**Piotr Raciborski**  
+48 22 222 1551  
[piotr.raciborski@wood.com](mailto:piotr.raciborski@wood.com)

### Macroeconomics

**Alessio Chiesa**  
+44 75177 06102  
[alessio.chiesa@wood.com](mailto:alessio.chiesa@wood.com)

### Energy

**Jonathan Lamb**  
+44 20 3530 0621  
[jonathan.lamb@wood.com](mailto:jonathan.lamb@wood.com)

### Utilities/Mining/Pharma

**Bram Buring**  
+420 222 096 250  
[bram.buring@wood.com](mailto:bram.buring@wood.com)

### Consumer/Real Estate

**Jakub Caithaml**  
+420 222 096 481  
[jakub.caithaml@wood.com](mailto:jakub.caithaml@wood.com)

### Gaming/Mid-caps

**Maria Mickiewicz**  
+48 602 450 718  
[maria.mickiewicz@wood.com](mailto:maria.mickiewicz@wood.com)

### Turkey

**Can Yurtcan**  
+420 222 096 780  
[can.yurtcan@wood.com](mailto:can.yurtcan@wood.com)

### Russia

**Dmitry Vlasov**  
+44 750 714 6702  
[dmitry.vlasov@wood.com](mailto:dmitry.vlasov@wood.com)

### Financials

**Miguel Dias**  
+420 735 729 418  
[miguel.dias@wood.com](mailto:miguel.dias@wood.com)

### Real Estate

**Peter Palovic**  
+420 222 096 486  
[peter.palovic@wood.cz](mailto:peter.palovic@wood.cz)

## Sales

### Co-Head of Equities

**Jarek Tomczynski**  
+48 22 222 1611  
[jarek.tomczynski@wood.com](mailto:jarek.tomczynski@wood.com)

### Ilgin Erdogan

+420 222 096 708  
[ilgin.erdogan@wood.com](mailto:ilgin.erdogan@wood.com)

### Jan Koch

+48 22 222 1616  
[jan.koch@wood.com](mailto:jan.koch@wood.com)

### Piotr Kopec

+48 22 222 1615  
[piotr.kopec@wood.com](mailto:piotr.kopec@wood.com)

### Ioana Pop

+44 20 3530 0693  
[ioana.pop@wood.com](mailto:ioana.pop@wood.com)

### Tatiana Sarandinaki

Brasil Plural in association with WOOD&Co.  
1 212 388 5613  
[tsarandinaki@wood-brasilplural.com](mailto:tsarandinaki@wood-brasilplural.com)

## Sales Trading and Execution Services

### Co-Head of Equities

**Zuzana Mora**  
+420 222 096 283  
[zuzana.mora@wood.com](mailto:zuzana.mora@wood.com)

### Jan Koch

+48 22 222 1616  
[jan.koch@wood.com](mailto:jan.koch@wood.com)

### Ermir Shkurti

+420 222 096 847  
[ermir.shkurti@wood.com](mailto:ermir.shkurti@wood.com)

### Vladimir Vavra

+420 222 096 397  
[vladimir.vavra@wood.com](mailto:vladimir.vavra@wood.com)

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